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H-1790-1 - NATIONAL ENVIRONMENTAL POLICY ACT HANDBOOK
ENVIRONMENTAL ASSESSMENT

BLM Office: Pinedale Field Office

EA Number: WY100-EA02-309

Date: September 19, 2002

Lease/Serial/Case No.: WYW-155092

PROPOSED ACTION HISTORY, TYPE, LOCATION: On 2/14/2002, Veritas DGC Land (Veritas) filed a Notice of Intent (NOI) with the BLM-Pinedale Field Office (PFO) to conduct a 3D geophysical project entitled the Merna 3D Geophysical Project (M3D). On June 4, Veritas submitted an amendment to the NOI, revising boundaries of the project to include a total of 290 square miles. On July 16, Veritas submitted a second amendment, reducing the project to 265 square miles. Copies of the NOI and amendments are included at Appendix A of this EA. This Environmental Assessment addresses potential effects to the final 265 square mile project area, regardless of surface ownership.

The project area would cover 169,555 acres in an irregular but generally rectangular block varying from 4 to 9 miles east-west by 32 miles north-south. The northern boundary of the block runs east-west south of Hoback Ranches and three miles south of the Bridger-Teton National Forest boundary. Daniel Junction is central to the overall project area, while the southern extremity of the project is located 4 miles east and 3 miles north of the Sublette County Fairgrounds (at the junction of highways 189 and 351) just north of Big Piney/Marbleton. Of the total acreage in the project boundary, some 67,822 ac (40%) are BLM administered land, 8477 ac (5%) are State land, and 93255 ac (55%) are privately owned. Please note that portions of the project occurring on private and State lands are not subject to BLM authorization.

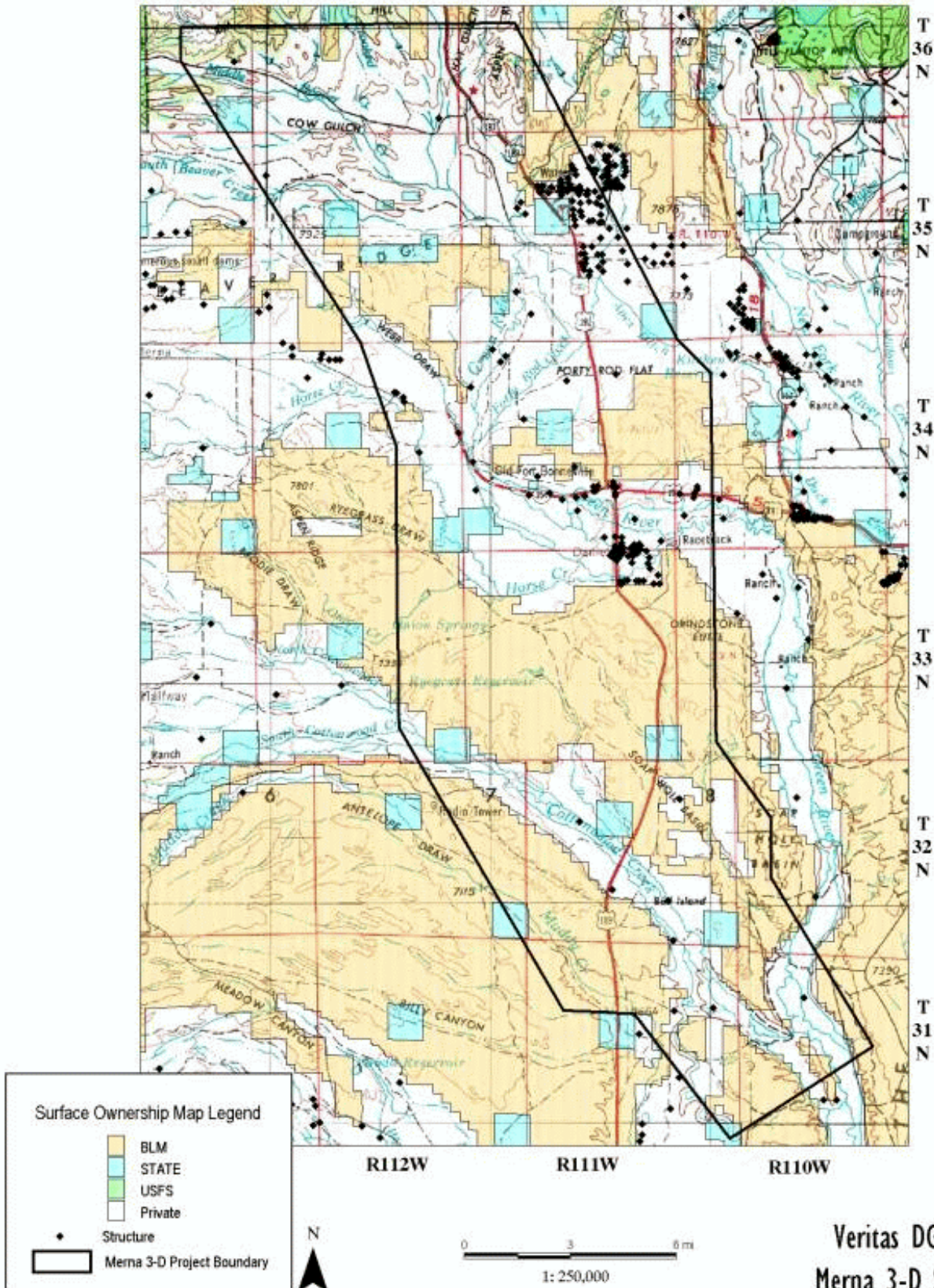
Total surface area within the project would indeed be approximately 265 square miles, but actual surface use area by the proposed seismic program would be restricted to 100 ft wide corridors along the seismic lines, a small percentage of this area.

Location of the project and surface ownership of the area to be affected is shown on Map 1. A 7.5' scale map of the proposed project area showing the proposed locations of source and receiver points can be found in the BLM project case file. The M3D area lies within the Sections listed below.

T31N - R110W Sec. 4-10, 15-22, 29-31
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 T33N - R112W Sec. 1-2, 11-14, 23-26, 35, 36
 T34N - R110W Sec. 6-7, 18-19, 30-31
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 T35N - R112W Sec. 1-18, 20-29, 33-36
 T35N - R113W Sec. 1, 12
 T36N - R111W Sec. 19-20, 28-33
 T36N - R112W Sec. 19-36
 T36N - R113W Sec. 23-26, 35-36

MAP 1

Surface Ownership/ Project Boundary



CONFORMANCE WITH APPLICABLE LAND USE PLAN: The proposed action is subject to the Pinedale Resource Management Plan/Environmental Impact Statement (RMP), approved on December 12, 1988. The BLM-Pinedale Field Office, as required by 43 CFR 1610.5, has determined that the proposed action, with the modifications herein applied, does comply with the decisions, guidelines, terms and conditions of the RMP.

Concerning geophysical projects, the RMP states, "Geophysical notices of intent will be evaluated on a case-by-case basis. All acreage in the planning area will be subject to various appropriate limitations (e.g., vehicle use restrictions), including about 517,170 acres subject to seasonal limitations. In addition, the use of explosive charges may not be allowed in any area if analysis determines that unacceptable adverse impacts would occur. Generally, all authorizations will be issued with appropriate application of surface disturbance mitigation requirements as presented in Appendix A-1." (PRA RMP ROD p.16).

A. Relationship to Statutes and Regulations: This environmental assessment was prepared in accordance with the National Environmental Policy Act of 1970 (NEPA). Authority for the proposed action and alternatives is contained in the Mineral Leasing Act of 1920, as amended, and in the Code of Federal Regulations at 43 CFR 3150.

B. Remarks: Impacts resulting from project operations in their entirety are analyzed, including impacts to private and state lands. However, BLM's authority for imposing mitigation measures, including terms and conditions for approval of the NOI, pertains only to the federal lands, except on issues relating to 1) sites listed, eligible, or potentially eligible for the National Register of Historic Places and 2) Threatened and Endangered Species.

BLM approval of a Notice of Intent would permit an operation to take place on BLM-administered land, subject to conditions of approval. BLM approval would not constitute permission to operate on non-federal lands.

NEED FOR PROPOSED ACTION: The proposed action, the M3D geophysical project, is needed in order to acquire and evaluate subsurface geological data for further development of oil and gas reserves. The majority of federal minerals within the M3D have been leased for oil and gas development or are available for lease (PAPA EIS ROD pp.34-35, PRA RMP ROD pp.12, 15), although some lease areas are identified for No Surface Occupancy or No Surface Disturbance (ibid., pp. 10, 12), as specified later in this EA. Well drilling in portions of the M3D project area is currently on-going. The proposed M3D is designed to collect subsurface data which should enable wells to be drilled with a greater probability of tapping producible hydrocarbons than is attainable without geophysical exploration. The project, thus, should result in the drilling of fewer 'dry holes' in the future, minimizing the need for drilling and associated environmental disturbance. Well drilling has and is occurring in portions of the M3D project area. To date 33 wells have been drilled. Twenty-eight have been dry holes.

DESCRIPTION OF ALTERNATIVES CONSIDERED: **A. Alternative 1 - Proposed Action:** The proposed action is a mixed-source geophysical exploration; energy source would be created by vibroseis buggies in most of the project area, and by shot hole in areas of problematic terrain. Facets of the operation are outlined below. The proposed project would be permitted with the BLM, State of Wyoming Oil & Gas Conservation Commission and appropriate surface owners.

Survey/staking: During the survey/staking phase, Veritas proposes to utilize a crew of 8-12 surveyors utilizing the global positioning system (GPS) to accurately place pin flags at predetermined points along receiver lines. Source points and all travel routes to them will be mapped utilizing GPS. All terrain vehicles (ATVs) will be used for some of the survey work. Several survey base stations for GPS radio towers will be required. Should they be needed on BLM land, the base stations will be specifically permitted.

Ninety-four receiver lines will be aligned east/west across the project area, spaced 1760 feet apart. Along these lines, receiver / geophone points will be pin-flagged every 220 feet.

Ninety three zig-zag pattern source lines (swaths) will be aligned generally east-west across the project area between the receiver lines. Along source lines, source (vibration or shot) points will be stationed every 311 feet where possible. Source points will be positioned in offset positions to avoid rough terrain, existing facilities, or other areas of concern such as wetland areas and archaeological sites. Normal survey parameters allow for up to a 1760 ft offset. All source points which are to be drilled (shot hole) will be marked with lath. All off-road travel routes will be flagged.

While verifying source point locations in the field, surveyors will determine which points can be accessed by buggy

vibes, which will need to be drill points, and what type of drill would be used at such points. A total of 18,954 source points are planned within the M3D.

Drilling: Approximately 20 percent of source points planned are to be drilled, a total of 3790 shot-holes. Buggy drills will be used to drill holes in areas not accessible to buggy vibes. These holes will not exceed 120 ft deep and will be loaded with no more than 30 lbs explosive charge. Buggy drills weigh just under 20,000 lbs and are outfitted with 43-inch (3.6 ft) wide low-ground-pressure (ca. 6 psi) tires. Buggy drill access would be via flagged drive routes. It is estimated that approximately 75 percent of the shot-holes in the project would be drilled by buggy-drill equipment, a total of 2840 buggy-drilled shot-holes. Vibroseis operations involve 4 buggies creating energy at each source point. Drilling operations involve a single buggy at each source point.

Mini-drills may be used in areas where terrain cannot support buggies (either buggy-vibes or buggy-drills), primarily in low-lying and year-round wet areas. In such areas, groups of 3 to 5 shallow drill holes, each 10 to 20 ft deep, would be drilled and loaded with 1-2 lbs of explosive. Mini-drills are small drills mounted on a track vehicle about the size of a four-wheeler. Mini-drill access would be via flagged drive routes. It is estimated that 15 percent of the project shot-holes would be made via mini-drills, a total of 570 mini-drilled shot hole points.

Heliportable drills will be used in timbered areas, in areas where slopes are too steep for vehicles, or where the ground is too soft to support self-propelled equipment, and generally would be concentrated in the north. This method is associated with minimal surface disturbance. Heliportable drill access, of course, is by air. It is estimated that 10 percent of the project shot-holes would be heliportable-drilled shot points, a total of about 380 heli-drilled shot points.

Regardless of drilling method, all drill cuttings would be placed back in the holes. In compliance with Wyoming Oil & Gas Conservation Commission Rules and Regulations Chapter 4, Section 6, Paragraph P, bentonite would be used in any holes drilled into water bearing zones. Drilling operations would be conducted during daylight hours only. Water for drilling fluid will be obtained from irrigation ditches on private land in accordance with Wyoming State Engineer permit, or from a local commercial water hauler.

Cable layout: A helicopter will be used to transport receiver equipment along receiver lines. Caches of cables, data collectors, batteries, and geophones will be placed along receiver lines, normally at 6 geophone station intervals (every 1320 ft), or closer when necessary. Equipment unpacking and layout, geophone placement and cable connection work, and equipment bundling for helicopter pick-up is accomplished by crews of pedestrian workers, who will alternately layout and pick-up as needed. No truck or buggy vibe traffic is planned along receiver lines, only helicopter-assisted pedestrians and ATVs will be used. Cable deployment field operations will be performed during daylight hours.

Vibroseis operations: Once a minimum of 8 receiver lines are functional, four buggy vibes will be used to create energy source at each source point. Two independent teams of four buggy vibes may work in tandem on adjacent blocks of source points, in order to speed up project completion. Separate teams would not travel the lines traversed by the other team. As the project proceeds to the interior of the 3D program, a minimum of 14 live receiver lines will be used, 7 ahead of the energy source and 7 behind. It is estimated that 80 percent of the project source points would be vibroseis points, or a total of 15,163 vibroseis points.

The vibe buggies will proceed side-by-side along source lines, with two buggy vibes on each side of the predetermined flagged route. At each source point, the units will create an energy source (shake) of 6 sweeps. Buggy vibes will follow GPS and flagged travel routes to move from one source point to another and from one swath to another.

The buggy vibes are 12-ft 6-in high, 35-ft 6-in long, and 11-ft 6-in wide. They weigh 62,000 pounds each and are equipped with 43-in (3.6 ft) wide low-pressure tires, which give them a ground pressure of less than 16 PSI. This configuration provides for optimum traction (minimal spinning) while minimizing soil compaction, resulting in reduced potential for two-track roads being formed. Vibrator pads measuring 4.5' x 7.5' are centered under the vehicle. Refueling of buggy vibes will be at existing roads and trails.

Vibrating activities will be performed 24 hours per day, except in areas of rough terrain, and residential areas where work will generally occur during daylight hours.

Shot hole detonation: When vibroseis operations within a recording swath reach the inaccessible areas where source is to be created by shot holes, the pre-set charges will be individually detonated by a 'shooter' on an ATV. Cap wires would be cut off below ground level, and lath and flagging would be removed at that time. Shooting operations will normally be performed during daylight hours.

Data collection/recording: During the data acquisition phase of the project, 3D geophysical data will be recorded with specialized equipment including cables, geophones, and one truck-mounted recording unit (the recorder). Veritas will use either an MRX or an RSR recording system. The MRX system involves a continuous cable that connects all receiver stations and receiver lines to each other and to the recording truck where the data is collected.

The RSR recording system utilizes multiple independently operating sets of 6 geophone arrays (one array per receiver station), which are connected to a field data collector box with a battery. The RSR system stores the data within each data collector box, and requires down-loading /collection periodically. RSR data down-loading/collection is accomplished by a field technician with a ca. 25 lb data collection unit who would typically drive an ATV to each field box. Collected data is then transported to the field office for transcribing. The data will have to be collected on each individual receiver line 2-3 times during the recording phase. Veritas DGC has made the operational commitment to minimize ATV trips along each line during the recording phase, with each trip using a different route, to minimize vegetation and surface disturbance.

In both systems, receiver lines would be repaired / troubleshot as needed via use of ATVs. The ATVs are typical one-passenger four-wheelers with 9-in (0.75 ft) wide tires. ATVs will operate within 50 ft either side of the receiver lines and would use a different path each trip down the line to prevent the creation of new two-track ATV trails.

Staging areas: Several helicopter staging areas and equipment staging areas will be required. Staging areas provide for temporary placement of cable and geophone trailers, helicopter fuel storage, helicopter landing pad, and parking for crew transport vehicles. Staging area locations are yet unidentified, but will be located on previously disturbed areas such as well pads, or where feasible, on State or private land. If a staging area were required on BLM land, it would be permitted separately. A typical staging area would be approximately 200 x 200 ft in size.

Public roads: Operations within the highway and county road rights-of-ways would be subject to Sublette County and Wyoming Department of Transportation approval and restrictions. Geophone cables would be placed across these roads with warning signs ahead of the cable crossings. Cable would be taped to the pavement to prevent movement when crossed by traffic. As winter approaches, cables would be extended and routed through existing culverts, to avoid conflicts with snowplows. 'Men working' signs would be placed along the highways and county roads when vibe-buggy operations are in the vicinity of these roads. The vibe-buggies are equipped with flashing amber lights to alert traffic of their presence. Flag vehicles would be used in front and behind the vibe-buggies any time they are traveling up and down the state or federal highways. Flag vehicles would not be used on county roads.

Snow operations: Shothole drilling should be completed well before heavy winter snows arrive, but vibroseis operations in December could encounter deep snow. The buggy vibes can operate without assistance in snows 2-3 ft deep (Mike Dighans, Veritas, personal communication). If deep snow is encountered, a 4 x 4 or crawler tractor or equivalent equipment will be used to break trail for the buggy vibes. This would be done by simply driving ahead of the vibes or by clearing snow with the plow blade raised at least 2 ft above the ground. Snow would be compacted, but no soil would be exposed or vegetation uprooted via this operation.

Clean-up: The project clean-up phase will proceed concurrently with the recording phase. Pin flags, lath, ribbon flagging and trash will be collected daily, as the recording crew works through the project area. These materials will be deposited at a Wyoming DEQ approved disposal site.

Schedule: Survey/staking of the proposed project is planned to begin in late summer 2002. Archeological inventory of BLM portions of the project would follow about 2 weeks behind the surveying. Drilling operations would begin about 8/15/02 on private land. On BLM lands, survey and archeological inventory work constituting 'casual use' would be conducted under the authority of 43 CFR 3150. On private lands, where BLM has no jurisdiction or authority, BLM authorization is not required. Geophysical recording is scheduled to commence mid-September, and should be complete by approximately 12/25/02. Recording operations are planned to start at the south and proceed north.

B. Alternative 2 (Winter Operations): This alternative would be similar to the proposed alternative in most operational regards, but involves conducting the exploration work from approximately November 15 to March 15. This alternative was the initial one conceived and considered by Veritas, who prefers this alternative for reasons summarized below. The alternative was rejected at the onset by BLM, due to conflicts with winter wildlife restrictions, but still meets the criteria to be considered through this EA.

Under this alternative, surveying and staking operations would be similar to those for Alternative 1, but would be done only where drill points are proposed; drill points and vehicular access to them would be surveyed/staked. Drilling operations would be conducted as described for Alternative 1, during late fall, prior to winter conditions.

GPS-equipped vibroseis units would be utilized, which would locate and vibrate at the (planned but previously unsurveyed/staked) vib point locations.

Vibrator operations in deep snow would be conducted in the manner described in the proposed action.

Potential effects to cultural resources would be consulted on and addressed by a project-specific Programmatic Agreement (PA) between BLM and the Wyoming State Historic Preservation Office. With SHPO concurrence, Class III cultural resource inventory could potentially be waived for operations conducted under sufficiently environmentally-protective snow and frozen ground conditions. Specific cultural resource inventory and avoidance measures would be required as necessary by the PA, to monitor project impacts, to protect special resources, and as contingencies for environmental conditions not meeting snow and frozen ground criteria.

Cable layout and shot-hole detonation, and data collection/recording operations would be conducted (from approximately December 1 to March 31) as described under Alternative 1, except that snowmobiles may be substituted for ATVs, as appropriate to ground conditions.

Staging area, transportation, and clean-up needs and plans remain the same as under Alternative 1.

Surveying/staking of the proposed drill areas would begin about 9/15/02. Archeological inventory of BLM portions of the project slated for drilling would follow closely behind, approximately 9/20/02. Drilling operations would begin approximately 1/15 and proceed ahead of recording operations. Vibrating and geophysical recording operations would begin November 15 and should be complete by approximately March 15. To follow the winter / snow conditions southward toward lower elevation, recording operations would start at the north and proceed south.

C. Alternative 3 (No Winter Operations): For this project, the Wyoming Outdoor Council, Biodiversity Conservation Associates, Defenders of Wildlife, Greater Yellowstone Coalition, Jackson Hole Conservation Alliance, Natural Resources Defense Council, Wilderness Society, and Wyoming Chapter of the Sierra Club requested that an alternative be considered in which surface disturbance activities in big game winter and transitional ranges and migration corridors and bottlenecks would be prohibited after November 15 (see p. 8 of letter Appendix C). The full extent of all winter and transitional ranges and migration corridors and bottlenecks includes virtually all of the M3D, as reflected in the Affected Environment section of this EA. With the presence of sage grouse leks and nesting areas, raptor nests, and ground-nesting bird standard Spring-time restrictions in the M3D, the operational window for geophysical operations is limited to the period between August 1 and November 15, a period of 3 1/2 months, unless timing exception is granted.

Under this alternative, survey/staking of the project would begin in mid-July 2002. Archeological inventory of BLM portions of the project would follow in early August. (On BLM lands, survey and archeological inventory work constituting 'casual use' would be conducted under the authority of 43 CFR 3150. On private lands, where BLM has no jurisdiction or authority, BLM authorization is not required.) Drilling operations would begin mid-August. Geophysical recording would commence September 1, and would cease for the season on November 14. As with the proposed action, recording operations would start at the south and proceed north. It is estimated that about half of the project would be completed by November 14, reaching approximately the Daniel Junction area. In order to comport with landowner stipulations regarding hayfields, geophysical recording operations in the northern half of the project would begin approximately September 1, 2003, and be complete by approximately October 20.

Adoption of this alternative as applied via the above outlined schedule would result in increased cost to Veritas to perform the project, related to bringing crew to the area a second time, repeated set -up and equipment testing procedures, and the necessity to lay some geophone lines overlapping with the previously recorded southern half of the project to assure data continuity. Mineral lessees (Veritas clients) with holdings in the northern half of the M3D would suffer approximately 1 year's delay in availability of 3D geophysical data for this area. It is not clear that selection of this alternative would result in cancellation of the overall M3D, by Veritas. This alternative therefore meets criteria for full analysis in this EA.

Note however that selection of this alternative would not preclude project operations on private land during the winter.

D. Alternative 4 (No Action): Under the No Action alternative, geophysical data acquisition operations would not be authorized on BLM-administered surface. Operations could still occur on state and private lands. BLM land comprises about 40% of the project area, concentrated in the south half of the M3D boundary. Considering that private and State lands comprise the remaining 60% of the M3D area, and that the overwhelming majority of the minerals under these private and state lands are leased for oil and gas, adoption of the No Action alternative could very likely result in the completion of the northern roughly half of the project without including public land tracts in that area, without federal (BLM, FWS, ACHP) oversight. Environmental consequences of the No Action alternative are analyzed in detail in this EA.

E. Alternatives Considered, But Not Included in the Detailed Analysis: Based on a recent request from the Wyoming Outdoor Council (WOC) et al (see letter at Appendix C), and on a previous similar suggestion from WOC, the Jackson Hole Conservation Alliance, and Greater Yellowstone Coalition for similar projects in the past, a '**no land vehicle operations**' alternative was considered. Under this alternative, only man-portable drilling equipment transported by crews on foot, or heli-portable drills, would be used to drill shot-holes for the subsequent deployment of explosive charges as the sole energy source. Project staking and geophone trouble-shooting would be accomplished exclusively by pedestrians. In sum, no off-road vehicle operations would occur in connection with this method of operations.. Specifics of heli-portable drill operations, cable placement, and other facets of the project would be carried out in the same manner as under same as Alternative 1.

In order to produce roughly comparable geophysical data under this alternative, Veritas would drill a 60 ft deep hole loaded with a 10 pound bottom-hole explosive charge at each source point. (Man-portable drills are not capable of drilling holes this deep,; therefore heliportable drills would be used exclusively.) Each shot-hole would take approximately one to two hours to drill, load, and plug, including transportation to and from each shot-hole. Each heli-drill, thus, would average approximately 5 holes per day. Using ten heli-drills, project drill production could thus average 50 holes per day. With a total of about 19,000 planned source points in the M3D, 380 days (12.5 months) of continuous drilling with no weather days or other down-time would be required to complete drilling phase. Twenty heli-drills would reduce this drilling time by half, if 20 drills could be found. The integrity of buried undetonated charges could be problematic, if left in the ground for more than one year. The disturbance to wildlife and humans would last much longer if this alternative was adopted.

The economic impact, in terms of cost to Veritas and its clients the mineral lessees, would be substantial, and would be prohibitive (see Appendix B, letter from Richard Trevino, Veritas DGC Land, Inc.). Veritas has estimated that the exclusively heli-portable drilling would roughly quadruple the cost of the project, making it economically infeasible. The average cost of a heli-portable-drilled source point meeting these specifications is approximately \$1200 per source point. Cost of the project under this alternative would be in the vicinity of (\$1200 x 18954 source points=) 23 million dollars, as compared to ca. \$ 5.9 million under the proposed Action / Alternative A.. Due to these costs, it is likely that selection of this alternative would result in project cancellation, rendering the environmental consequences of this alternative the same as for the No Action alternative, which is analyzed in detail. Full analysis of this alternative was therefore deemed unnecessary.

For this project, WOC et al also requested that an alternative be considered in which surface disturbance activities in **big game winter and transitional ranges and migration corridors and bottlenecks would be prohibited year-round** (see letter at Appendix C). The full extent of all winter and transitional ranges and migration corridors and bottlenecks includes virtually all of the M3D, as alluded to above and reflected in the Affected Environment section of this EA,. Adoption of this alternative would equate to denial of the M3D project. Environmental consequences, thus, would be the same as the No Action alternative, which is analyzed in detail.

AFFECTED ENVIRONMENT: The physical area which would be affected by the proposed action is described previously in the project location description, and is depicted on Map 1 and in more detail on the pre-plot map in the BLM project case file. Critical elements of the human environment and whether they would be affected by the proposed project are listed below.

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

<u>Element</u>	<u>Status on EA Area</u>	<u>Addressed in EA ?</u>
Air Quality	Minimally Affected	Yes
Areas of Critical Environmental Concern	None Present	No
Cultural Resources	Potentially Affected	Yes
Farmlands (Prime or Unique)	None Present	No
Floodplains	Potentially Affected	Yes
Native American Religious Concerns	Potentially Affected	Yes
Threatened and Endangered Species	Potentially Affected	Yes
Wastes (Hazardous or Solid)	Not Affected	Yes
Water Quality	Potentially Affected	Yes
Wetlands/Riparian Habitat	Potentially Affected	Yes
Wild and Scenic Rivers	Potentially Affected	Yes
Wilderness	None Present	No
Environmental Justice	Not Affected	No
Invasive Plants	Potentially Affected	Yes

A. Wildlife -- Uplands in the M3D project area support approximately 100 vertebrate species, while an estimated 200-300 vertebrate species inhabit the riparian and riverine environments in the project area (see wildlife maps available via the internet at <http://www.sdvc.uwyo.edu/clearinghouse>). In addition to the more prominent species specifically discussed below, the project area provides habitat for a variety of neo-tropical bird species, sandhill crane, white-tailed jack rabbit, cottontail rabbit, coyote, red fox, bobcat, mountain lion, pine marten, Richardson ground squirrel, thirteen-lined ground squirrel, badger, porcupine, racoon, skunk, least weasel, long-tailed weasel, mink, mice, spotted salamander, boreal frog, northern leopard frog, short-horned lizard, and the dwarf shrew. The New Fork and Green Rivers provides habitat for rainbow and brown trout, suckers, whitefish, ducks, beaver, muskrat, and river otter. Detailed information concerning wildlife sightings in the project area is available through the WG&FD Biological Services division, Cheyenne.

Identified prominent wildlife activity sites in the project area include big game winter range and migration routes, 2 elk feed grounds, raptor nests, sage grouse leks (strutting/mating grounds), and prairie dog towns. Further information concerning these species, their management, and the aforementioned sites in the M3D is available through the WG&FD and BLM Pinedale offices.

The project area serves as part of the expansive habitat occupied by the Sublette **Antelope** herd, the largest pronghorn herd in the world. Target population for this group is 48,000 individuals. Crucial winter range for the Sublette Antelope herd has been identified in the extreme southwestern portion of the M3D, as reflected on Map 2 as antelope winter closure area. A critical small population (ca. 300 head) of this herd ranges from summer habitat in and around Jackson Hole, as far as 170 miles southwest to winter ranges near I-80. This group undertakes the longest pronghorn migration in North America (Sawyer and Lindzey 2000 p.32). Telemetry studies indicate that in winter 99/00, an estimated 1500-200 pronghorn wintered along the southern end of the Mesa and the Sand Springs Draw area southwest of Boulder, just east of the M3D (ibid. p. 10). The M3D project area lies within the general north-south seasonal migration corridor, and is inhabited year-round by some animals. A general migration corridor has been identified running north-south through the northern half of the M3D. Near Daniel, the pronghorn veer generally east of the M3D, to follow along the Mesa and south through the Jonah Gas Field (ibid. p.15). The timing of antelope migration has been documented to differ greatly among years, ranging from October to January (ibid. p. 9). The antelope migration route's crossing of the Green River lies just (ca. 0.25 mi) northeast of the M3D, occupying a 4.2 mile long stretch of River from ca.2.5 to 6.7 linear (not river) miles upstream from Warren Bridge (ibid. map on p.23). Telemetry studies suggests 600-900 pronghorn use this river crossing twice a year (ibid. p. 23 text). Other notable features of the migration route near the M3D are the BTNF Boundary bottleneck and the Trappers Point bottleneck. Neither of these bottlenecks, however, lie within the M3D. The antelope migration route and related features are indicated on Map 3.

The M3D area is also part of the habitat occupied by the Sublette **Mule Deer** Herd Unit, which ranges from the Salt River and Snake River Mountain Ranges on the west to the Gros Ventre Range on the north, to the Wind River Range on the east, and Prospect Mountain, Figure Four, and Bird Canyons on the south. The herd unit has a population of over 34,000 (WG&FD 2002). The M3D project area lies within the general northwest-southeast seasonal migration route of northwestern deer heading to lowland winter range, and the area is inhabited year-round by some animals. Crucial winter range for the Sublette Mule Deer herd has been identified in four main areas within the M3D: Grindstone-Ryegrass, southwest Soap Hole Basin, the Cottonwood-Muddy Divide, and Cora Butte, as reflected on Map 2. Of note, the boundary shown for mule deer crucial winter range is a recent revision by the WG&FD, based on updated data (Doug McWhirter, biologist, WG&FD Pinedale). The revised boundary is being incorporated into the Pinedale RMP through a maintenance action.

A series of parallel northwest-southeast oriented deer migration routes have been identified in the Upper Green River Basin by the WG&FD, three of which pass through the M3D, as depicted on Map 3 (adapted from Figure 2 from Sawyer and Lindzey 2001). Larger scale and more detailed maps on file with the WG&FD Pinedale Regional office indicate many migration routes, which cumulatively occupy virtually the entire project area, skirting only areas of sizeable human impacts (e.g., large expanses of hayfields, Forty Rod Subdivision). Movement corridors along Webb Draw, Beaver Ridge, and near Warren Bridge are also likely to be heavily used by deer and some antelope from late October through late November (WG&FD letter of 7/8/02 at Appendix C).

The southern tip of one heavily used deer migration crossing of the Green River lies within the M3D, occupying a 5.2 mile long stretch of River from ca. 0.7 to 5.9 linear (not river) miles upstream from Warren Bridge (Sawyer and Lindzey 2001 map on p.24). It is estimated that about 3500 deer use this river crossing twice a year, peaking approximately late November and early April. Some of this river crossing area is shared with the antelope crossing. Several other areas of deer river crossing are contained within the M3D, located on private lands in the Soaphole-Grindstone area (ibid. p. 6). Another notable feature of the migration route near the M3D is the Trappers Point bottleneck, also shared by antelope. At least 2000 to 3000 deer pass through this ca. half mile wide bottleneck twice annually (ibid. p. 20). This bottleneck is east of the M3D project boundary. Deer migration routes and related features are indicated on Map 3.

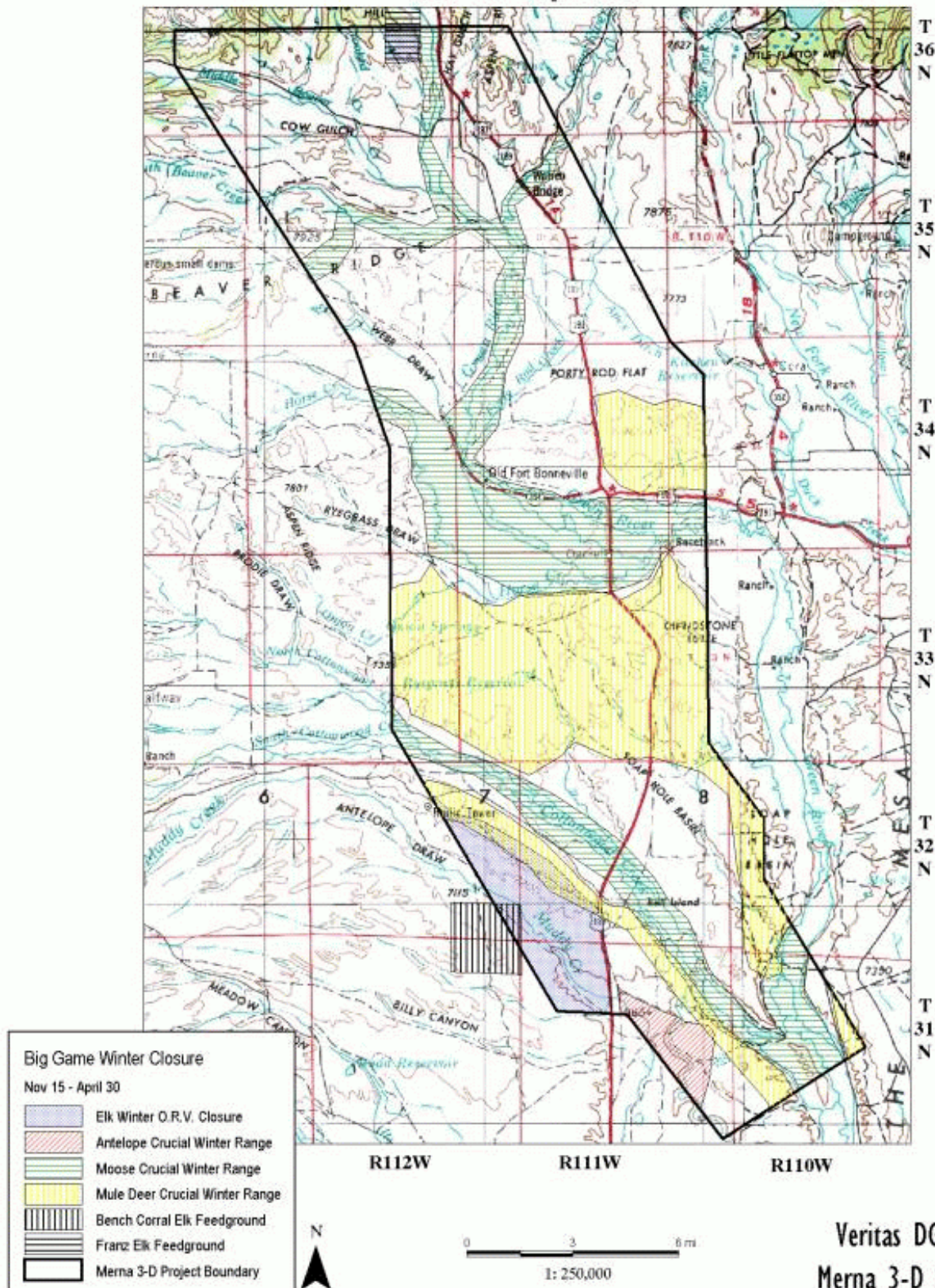
The northwestern portion of the M3D has recently been identified by some researchers as mule deer parturition range, including the Kismet Peak, Beaver Ride and north Horse Creek areas (Sawyer and Lindzey 2001 p. 34). To date, the WG&FD has not designated specific mule deer or other big game parturition areas within the M3D (Dan Stroud, WG&FD-Pinedale, personal communication, 9/2002)

Moose occupy the bottoms of the perennial streams in the M3D year-round. Accordingly, strips along the Green River, Beaver Creek, Horse Creek and Cottonwood Creek have been identified as moose crucial winter range, as reflected on Map 2. Moose are not herd animals, and are more solitary in nature than elk, antelope and mule deer. In comparison with migrating herd animals, density of moose in their ranges is relatively low and constant, although concentrations occur in some areas. North of Daniel, moose densities in the M3D are known to be generally low. Concentrations, however, do occur in the Horse Creek area within the M3D. The Sublette Moose Herd Unit, of which these animals are members, have a current estimated population of 5665 (WG&FD 2002).

The project area falls within the 1341 square mile Piney **Elk** Herd Unit, a herd of some 2500 animals. The population objective for this group is 2424 individuals (WG&FD 2002). Generally this herd ranges from the east slope of the Wyoming Range in the Bridger Teton National Forest and extends westward to Highway 189 and the Green River. Their range includes Horse Creek, Cottonwood, Piney, and the northern portion of the LaBarge Creek drainages. Historically this herd migrated to winter ranges in the sagebrush desert east of the Green River. In an effort to reduce damage problems to private landowners, the migration route was intentionally altered via the establishment of the Finnegan, Jewett, Franz, and Bench Corral elk feedgrounds. With rare exception, the traditional migration to the Little Colorado Desert no longer occurs in any significant numbers (WG&FD 2002). No crucial elk winter range has been identified within the M3D. However, ORV winter closure areas for elk have been established, and are reflected on Map 2. The WG&FD's Franz Elk Feedground and their Bench Corral Elk Feedground lie partially within the project area and are also seasonal elk closure areas, as indicated on Map 2.

Big Game Closure Areas Nov 15 - April 30

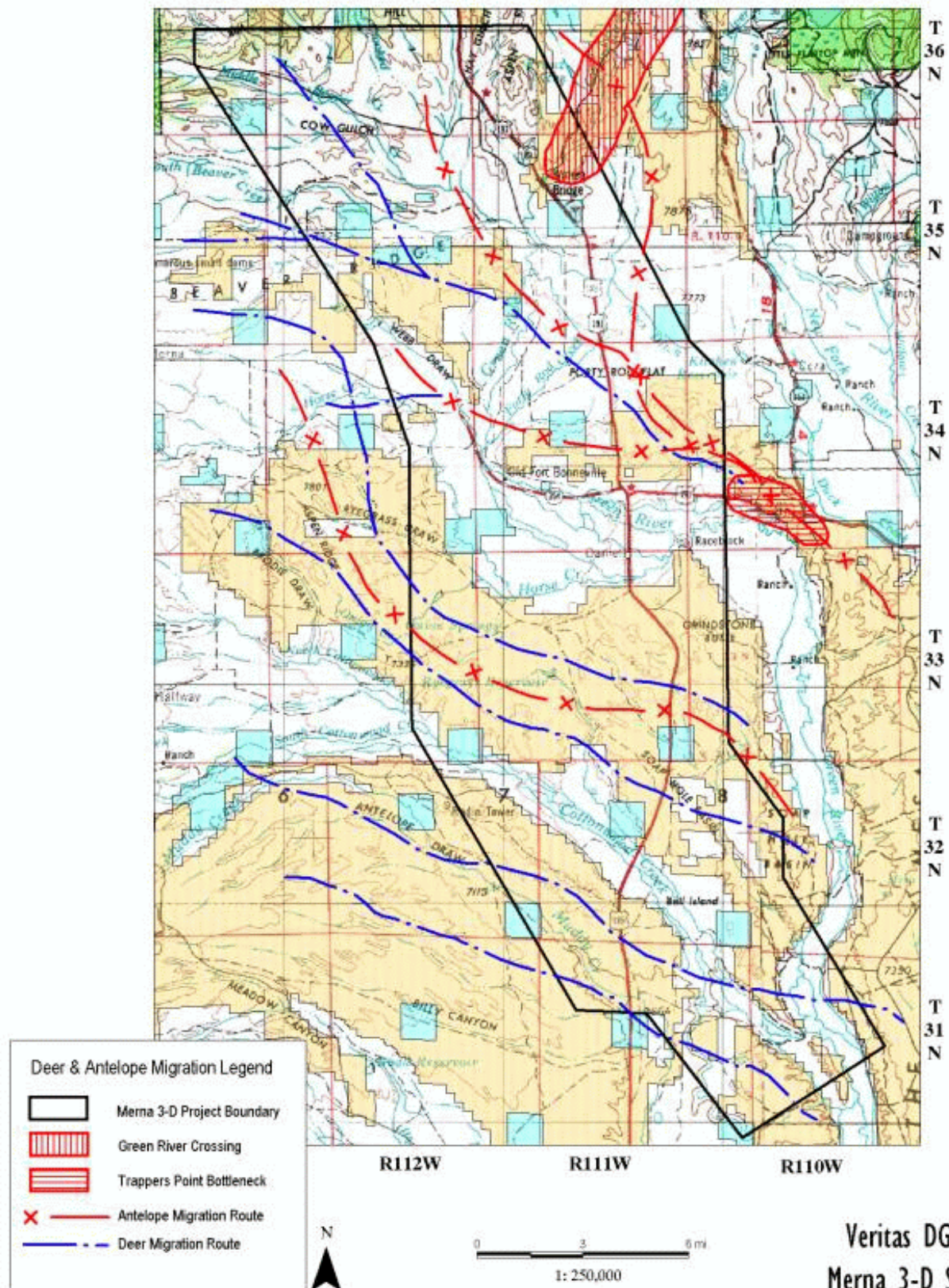
MAP 2



Veritas DGC Land, Inc.
Merna 3-D Seismic Project

MAP 3

Deer & Antelope Migration Corridors



Special Status Animal Wildlife Species – Eight federally designated threatened, endangered, proposed or candidate animal species are considered potentially present in the project area per the USFWS list 6/27/2002. Status of these species as regards the M3D project is summarized in tabular form below.

Threatened, Endangered, Proposed & Candidate Animal Species

<u>species</u>	<u>status</u>	<u>habitat</u>	<u>status in EA area / comments</u>
bald eagle	T	found throughout State	One documented nest within project area. Occupation/fledging inspection needed if activity 2/15-8/15. No winter roosts known for project area. Roosting inventory needed if activity 11/15-3/15.
grizzly bear	T	GYE resident	No suitable habitat in project-transient presence only. No info needed.
Canada lynx	T	montane forests	Potentially present. Bio Assessment needed for habitat portion of project.
black-footed ferret	E	prairie dog towns	None known. Avoid p.d. colonies or inventory needed.
mountain plover	P	grasslands	Potentially present. Inventory needed if activity 4/10-7/10.
whooping crane	X	palustrine wetlands, wet meadows	Highly unlikely in project area - transient presence only. No info needed.
gray wolf	X	primarily montane forest	No prime habitat in project - transient presence only. No info needed.
yellow-billed cuckoo	C	riparian areas with cottonwood overstory	No breeding habitat in project - transient presence only. No info needed.

T - threatened E - endangered P - proposed for listing X - experimental population C-candidate

One **bald eagle** nest is documented within the M3D, located on private land in the central project area (Keith Andrews, BLM-PFO, personal communication, 6/2002). No bald eagle winter roosts are known for the area.

No **grizzly bear** sightings within the M3D are documented on the WG&FD Wildlife Observation System (WOS) computer database, and none are known within or near the M3D boundary. The closest grizzly sighting is in the Teepee Creek drainage (David Moody, WG&FD-Lander, personal communication, 7/2002). One otherwise undocumented occurrence of grizzly bear scat in the project vicinity is referenced by a local landowner (see anonymous letter at Appendix C). In sum, while grizzly bear may occasionally pass through the northern portion of the M3D, the area is not suitable home range habitat for the species.

No **Canada lynx** sightings are on file with the WG&FD WOS for the project area, but USFS Bridger Teton Forest GIS maps indicate that one radio-collared female lynx is recorded as having been in the northern M3D project area once. This lynx denned in various spots within a ca. 3 x 9 square mile area in the Forest approximately 6+ miles west of the M3D. She died 3 years ago. Her mate was recorded twice within the northern portion of the M3D. Since the female's death, this lynx was confirmed to have traveled the entire length of the Wyoming Range north of Kemmerer into Montana (Barbara Franklin, USFS BTNF-Big Piney, personal communication 7/2002). The male lynx died in Spring 2002, and was found by a snowmobiler (ibid.). One historic lynx siting is also of record with the BTNF in this same immediate area as the radio and satellite derived documentation. Prime habitat for snowshoe hare and the dependent Canada lynx are present near the M3D, with marginal habitat present in the form of limited aspen and lodgepole pine forest stands within the project boundary.

There have been no confirmed sightings of **black-footed ferret** in Sublette County in recent decades, but a black-footed ferret skull was found in 2000 southeast of the Jonah Gas Field.

Often associated with prairie dog towns, **mountain plover** may be present in portions of the M3D. Mountain plover

migrate to Wyoming in March, and leave in July / August for winter areas. No sightings of mountain plover within the M3D are of record with the WG&FD WOS.

Whooping cranes which occasionally have been seen in Sublette County were part of population derived from a sandhill crane fostering program which hatched whooping crane chicks at the Grays Lake National Wildlife Refuge in Idaho from 1975-1989 (PAPA DEIS p.3-65). Fifty-five observations of whooping crane are known for the M3D area, according to WG&FD WOS records. Birds were seen to be roosting, resting, loafing, feeding and flying on the 55 occasions which occurred between 1978 and 1993. Occurrence of whooping crane in or near the M3D project area becomes more and more unlikely as the population dwindles. In 1995, only 4 birds from the experimental population were known to be alive (ibid.). Now 7 years later, none are expected to pass through the M3D area.

No sightings of gray wolf in the M3D are of record in the WG&FD WOS computer database. However, two adult and one juvenile **gray wolf** are known to have visited the Bench Corral elk feedground in winter 2001/2002, and killed 3 elk calves (Brad Hovinga, WG&FD Big Piney Game Warden, personal communication, 7/2002). No wolves have been reported at the Franz elk feedground, but such would not be unexpected. One otherwise undocumented wolf sighting in the project vicinity is referenced by a local landowner (see anonymous letter at Appendix C), and unusual wildlife sightings are not always reported to State and Federal agencies (see Tom Segerstrom letter at same Appendix). Thus, while wolf may occasionally occur in the M3D, their presence is brief and transient and their home / recovery range lies well to the north and west.

The **yellow-billed cuckoo** is a rare summer breeder in Wyoming, occurring in the Big Horn and Powder River Basins, and also along the Henry's and Black's Fork Rivers. WYNDD does not list the species in Sublette County (<http://uwadmnweb.uwyo.edu/wyndd/WYNDD/SpeciesofConcern.htm> website).

Twenty-eight animal species potentially present in the Pinedale Field Office have been accorded '**sensitive species**' status per BLM Wyoming State Office Instruction Memo WY-2001-040. These are dwarf shrew, long-eared myotis, pygmy rabbit, white-tailed prairie dog, Idaho pocket gopher, white-faced ibis, trumpeter swan, northern goshawk, ferruginous hawk, peregrine falcon, greater sage grouse, long-billed curlew, yellow-billed cuckoo, burrowing owl, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, roundtail chub, leatherside chub, bluehead sucker, flannelmouth sucker, Yellowstone cutthroat trout, Colorado River cutthroat trout, fine-spotted Snake River cutthroat trout, northern leopard frog, boreal toad, and spotted frog. Review of BLM and WG&FD WOS records indicates that, of these, the white tailed prairie dog, white-faced ibis, trumpeter swan, ferruginous hawk, peregrine falcon, greater sage grouse, long-billed curlew and burrowing owl, have been sighted in the M3D area. Further information on these species is available at the above listed WYNDD website.

Raptors including peregrine falcon, prairie falcon, osprey, kestrel, Swainson's hawk, Cooper's hawk and burrowing owls have been documented within the M3D, and numerous nests are known. Past nest inventory data are available through the BLM and WG&FD.

Much of the project area serves as **sage grouse** nesting habitat. Primary sage grouse nesting habitat includes areas within 0.5 to 3 miles from strutting sites (leks), but sage grouse have been documented to nest as much as 12 miles from their lek. Sage grouse hens typically nest on the ground beneath sagebrush measuring 15 to 22 inches tall for concealment. Known sage grouse leks within the M3D and the surrounding 2 mile radius nesting areas are depicted on Map 4.

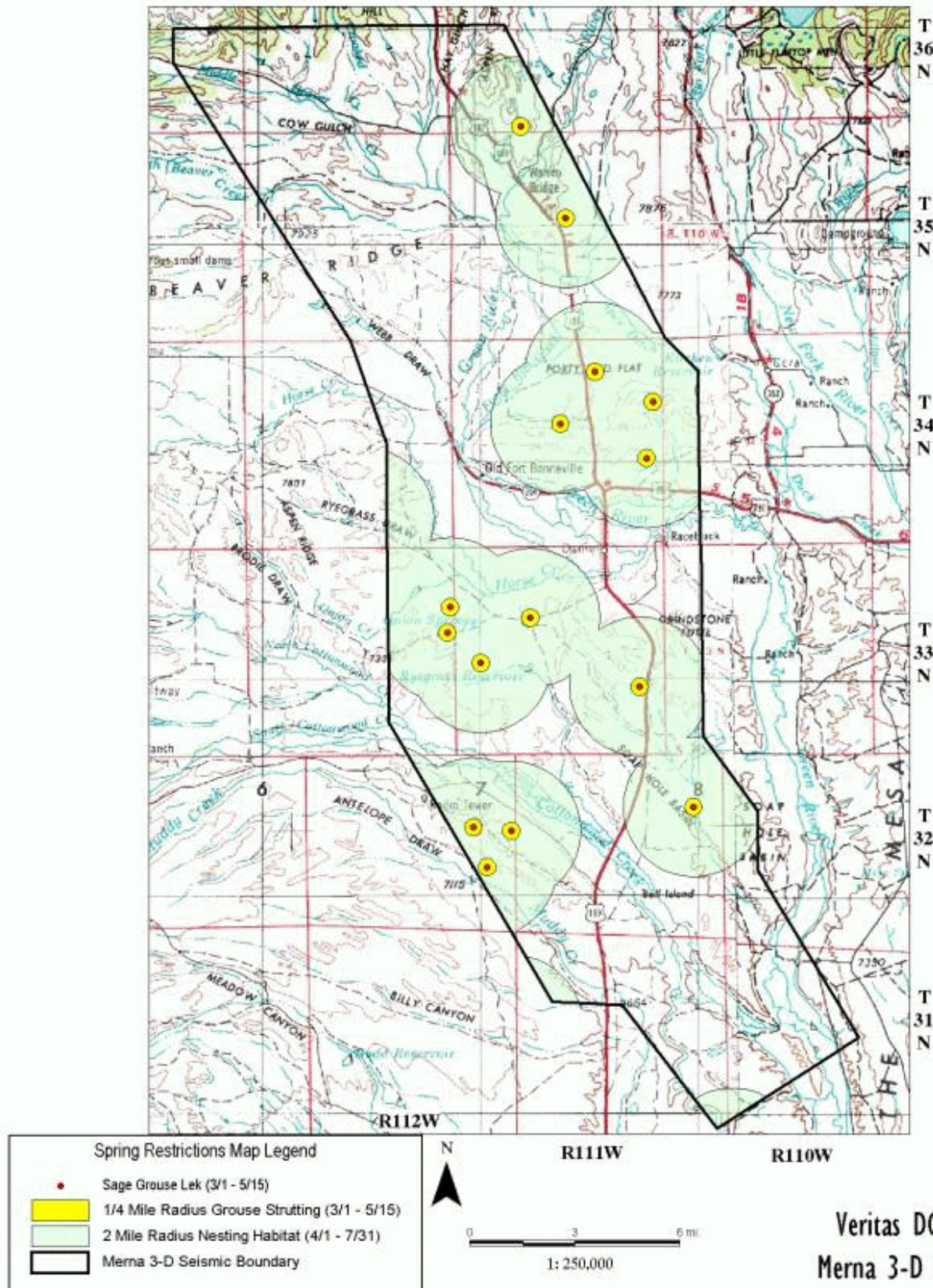
B. Cultural Resources

1) Historical and Archeological Resources --The overwhelming majority of the M3D project has not been inventoried for cultural resources. Results of past inventories in the general project area, however, suggests that 30 to 50 cultural resource properties may be expected within the immediate project impact area (Area of Potential Effect) on federal land. Cultural resource inventory of the APE surface is needed to evaluate potential impacts of the M3D project. Standard BLM procedures provide that federal surface must be inventoried at the Class III (field inspection) level and that non-federal lands must be inventoried at the Class I (records search) level. Identified cultural resource sites eligible or unevaluated for the National Register would be avoided by geophysical project redesign.

Notable sites known within the M3D boundary include the Prairie of the Mass site, Old Fort Bonneville, the Green River Rendezvous National Historic Landmark, and the Opal Wagon Road.

MAP 4

Spring Restrictions



The Prairie of the Mass, 48.SU.28, is the site where in July 1840 Father Pierre DeSmet offered the first mass in Wyoming, in the presence of 2000 Indians, trappers, and traders. The prairie itself looks much as it did at the time of the historic event, a generally wild meadow with spectacular views of the Green River bottoms immediately below and mountain ranges beyond, although the valley bottom contains houses and a highway, and a graveled road runs through the area. The current-use Daniel cemetery is also located here. The site, which is formally listed on the National Register of Historic Places, lies on private land in the SE/4 Section 36, T34N - R111W.

Fort Bonneville, 48.SU.29, is the site of an 1832 military outpost established by Captain Benjamin Bonneville. That summer, an 80 x 80 ft log stockade with diagonal blockhouses was erected, but abandoned by the army the same winter. Known as Fort Nonsense and Bonneville's Folly, the fort's location on the Green River proved to be impractical. The structures no longer remain, and the area is overgrown with 5 ft high sagebrush and willows. Archaeological excavations at the site, however, have yielded significant finds. The site, which is formally listed on the National Register of Historic Places, lies on private land in the NE NE Section 30, T34N - R111W.

The Green River Rendezvous National Historic Landmark (NHL), 48.SU.52, consists of a Congressionally-designated historic site 2 square miles in size located entirely on private land. The NHL is now part of the '7 Mile River Ranch', an exclusive housing development focused on fishing. Developer Ron Sapol of Jackson Hole Realty bought the ranch, divided it into 20-some parcels ranging from 65-290 acres in size, and has since sold over half the parcels. The area is unilaterally managed by its owners, but the National Park Service monitors the NHL's condition annually. The 7 Mile River Ranch is protected by many restrictive covenants (David Vlcek, BLM-PFO, personal communication). Minerals, including oil and gas, beneath the NHL are privately owned, and are not leased for development (Michael Dighans, Veritas, personal communication). As a federal (BLM) undertaking, the M3D proposal must be evaluated by BLM, and its effect on the NHL must be taken into account. Thus, despite private ownership, BLM responsibilities extend to the NHL, and the area will be subject to BLM special conditions.

Based on early General Land Office (GLO) plats, the Opal Wagon Road passes through the project area, generally running northward from Big Piney to Daniel, and then bending eastward toward Pinedale. Intact segments of this National Register eligible historic Trail have been recorded in this general region by past projects, and are anticipated to lie within the M3D. If remnants of the historic Trail are found, they would be subject to the normal 100 ft avoidance distance, standard for historic Expansion-era wagon roads.

History, prehistory, and notable sites in the area are summarized at greater length by recent larger-scale environmental documents (PAPA DEIS pp. 3.31-36, Jonah II DEIS pp. 3.23-25).

2) Native American Religious Concerns -- No sites potentially eligible for the National Register as a TCP, and no Indian Sacred Sites, as defined and protected by E.O.13007, are currently known for the project area to BLM or the Wyoming SHPO-CRO. Prehistoric rock alignment, cairn, stone circle, rock art and potential funerary sites are considered highly sensitive by Native American groups historically associated with this area, and so these sites are specially managed by BLM via the use of extended buffer zones as outlined below; while several of these types of sites are documented to lie within the overall project area, none are yet known to lie within the project APE. Required project-related cultural resource inventory may identify both 'new' and previously recorded sites of these types within the APE, particularly cairns and stone circle sites.

Based on BLM-Native American consultation in 2001, the following definition of the project Area of Potential Effect (APE) as pertains to sites of Native American concern will be applied. For non-surface disturbing (including geophysical) projects, the APE for known cairn and 'tipi ring' sites is considered 300 ft. The APE for known Traditional Cultural Properties (TCPs), rock art and unusual rock alignment sites (such as altars or medicine wheels) is considered 0.25 miles. The APE for known burial grounds is defined as 1 mile.

C. Soils Resources -- Soils in the M3D area are described in general terms and depicted on a large scale map in the PRA RMP DEIS (pp.135-136 and map Appendix).

Of note, the Soap Holes Basin is remarkable for its saline soils. BLM restrictions for this ca. 20,000 ac area call for minimizing surface disturbance on soils and watershed in Soap Holes Basin (PRA RMP ROD pp. 10, 19, 20). The unusually alkaline soils here offer potential for serious safety hazards as well as environmental damage. No other formal management units of sensitive soils have been identified within the M3D.

Badland formations, which are few and relatively dispersed across the general project area, typically are associated with fragile, highly erosive soils.

For more information, see soils maps and technical data covering the entire project area in varying levels of detail available on BLM GIS files, and specific soil survey reports for the Soap Holes Area (Fowkes 1967). A comprehensive soil survey of Sublette County has not been completed.

D. Livestock/Range -- The proposed project crosses portions of 45 grazing allotments. These are listed at Appendix D. Cattle, and to a far lesser extent horses, use these allotments. Most of the grazing occurs in early summer, however, some grazing could occur throughout the year. The Pinedale RMP/Draft EIS and BLM-PFO grazing allotment files contain additional information. Improvements associated with the allotments include water wells, spring developments, pipelines, stock water ponds, and pasture fences.

Private and State lands to be affected by the project contain numerous fences and an unknown number of water wells for livestock and domestic use. Irrigated and subirrigated hayfields and pasture are present in the project area, located on private land (see vegetation section).

E. Visual Resources (VRM) -- Roughly 42% of the M3D falls within VRM Class 4 designation, ca. 53% of the project area, primarily the Cottonwood Creek valley and extensive areas north of Daniel, falls within VRM Class 3 designation and the remaining 5%, composed of two non-contiguous segments along the Green River, have been accorded Class 2 status. No VRM Class 1 (highest protection category) lands lie within the project. VRM Class 4 lands are generally associated with BLM lands, while most Class 3 and 2 lands are privately owned. The VRM classification of lands in the project area is depicted on Map 5.

Based on BLM guidelines (PRA RMP ROD p.164), Class 2 areas should be managed to retain the existing character of the landscape; management activities may be seen, but should not attract the attention of the casual observer. Within Class 3 and 4 areas, surface disturbance can reach moderate to high levels, however even within Class 4 (least protected) areas, "every attempt should be made to minimize the impacts of these activities through careful location, minimal disturbance..." (ibid.). No Sensitive Resource Management Zones developed in connection with the Pinedale Anticline Project Area (PAPA) EIS lie within the M3D (PAPA EIS ROD pp. 28-30).

F. Vegetation

1) General Vegetative Cover-- The major vegetative cover types occurring in the project area are depicted on Map 6 and quantified in tabular below. For description of these vegetation types, refer to the Wyoming GAP Analysis Land Cover Atlas, which is available via the internet at <http://www.sdvc.uwyo.edu/clearinghouse> and <http://gap.uidaho.edu/gap>, and to the PAPA DEIS (p.3-54). Note that vegetative cover varies by geographic setting, which in turn is reflected by land ownership; comparison of the vegetation map with the land status map indicates that the majority of Wyoming big sage cover lies on public land, while the majority of hayfields, shrub-dominated riparian communities, aspen forest, and Mountain big sage communities are privately owned. On average, the southern part of the M3D area receives 10-14 inches precipitation per year, while the north receives 15-19 inches per year (USDA-SCS 1986). The project area is in its fourth year of drought.

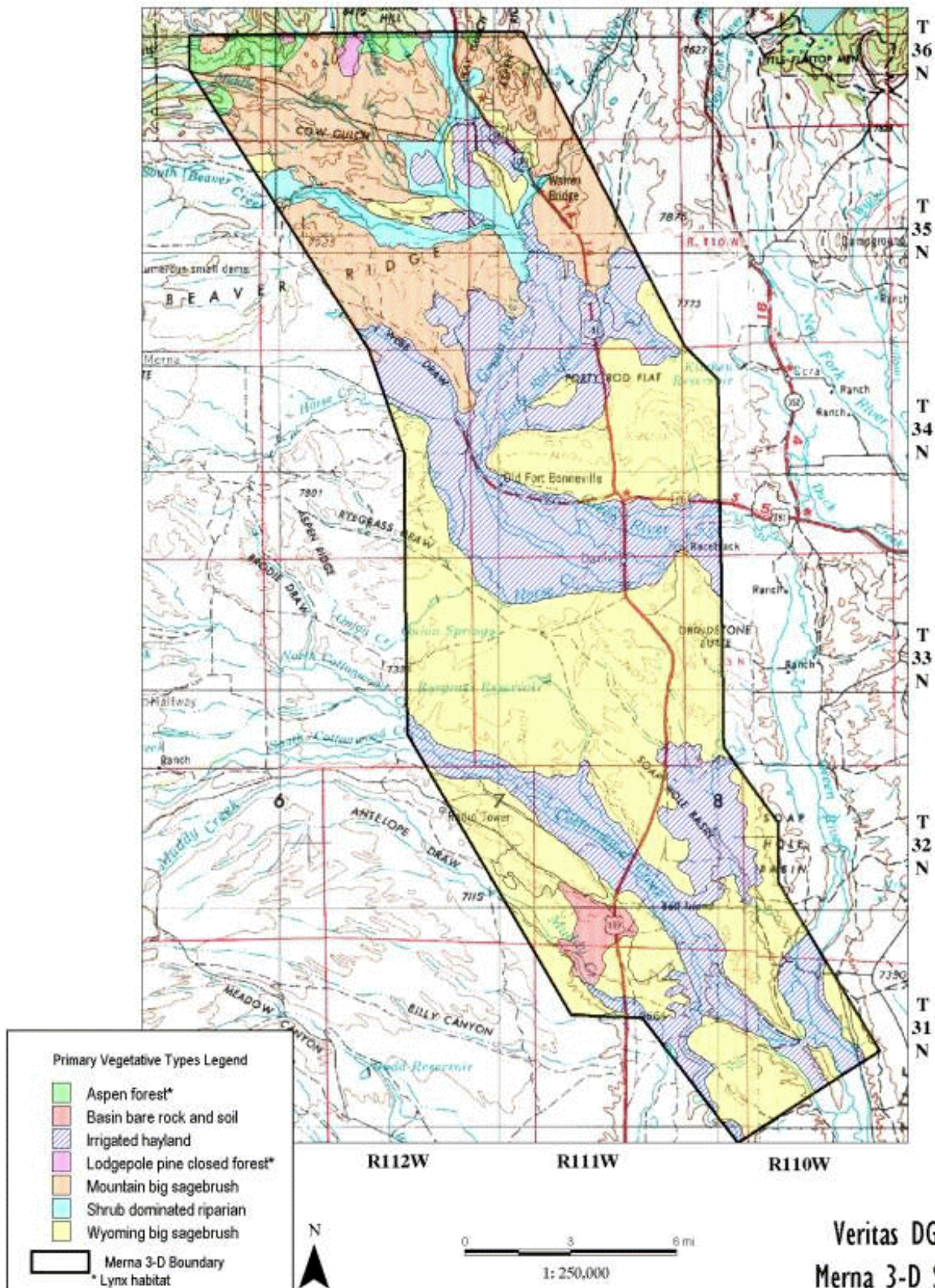
Vegetative Communities in the M3D

Primary Vegetation	acres (rounded)	%(rounded)
Wyoming big sagebrush	73,320	43%
Irrigated hayland	52,820	31%
Mountain big sagebrush	31,800	19%
Shrub-dominated riparian	6,330	4%
Aspen forest	2,650	2%
Basin bare rock and soil	2,060	1%
Lodgepole pine closed forest	570	<1%
	<hr/> 169,550 ac	<hr/> 100%



MAP 6

Primary Vegetative Types



2) Special Status Plants -- No federally designated threatened, endangered, proposed or candidate plant species are considered potentially present in the project area per USFWS correspondence of 6/27/02.

Six plant species potentially present in the Pinedale Field Office have been accorded 'sensitive species' status per BLM Wyoming State Office Instruction Memo WY-2001-040. No communities of any of these species have been documented within the M3D, per BLM GIS files. Potential habitat for these is contained within the M3D, however, and they may be present. The 6 sensitive status species and their habitats are summarized below. Refer to the Wyoming Rare Plant Field Guide (Fertig 1994) for more detailed plant and habitat descriptions.

Large-fruited bladderpod (*Lesquerella macrocarpa*) is a nearly prostrate, silvery-gray, yellow-flowered member of the mustard family which grows on gypsum-clay hills and benches, clay flats, and barren hills between 7200 and 7700 ft. Beaver Rim phlox (*Phlox pungens*) is a small prickly-leaved bushy, mat-like plant which grows on sparsely vegetated slopes on sandstone, siltstone or shale substrates between 6000 and 7400 ft AMSL. Meadow pussytoes (*Antennaria arcuata*) is a white-blossomed 12-15 inch tall silvery, slightly wooly plant which occurs in parts of Nevada, Idaho and Wyoming in moist hummocky meadows, seeps or springs surrounded by sagebrush grasslands between 4950-7900 ft. Trelease's milkvetch (*Astragalus racemosus treleasei*) is a member of the pea family which grows in sparsely vegetated sagebrush communities on shale or limestone outcrops and barren clay slopes between 6500 and 8200 ft. Cedar Rim thistle (*Cirsium aridum*) is a small purple-flowered member of the sunflower family endemic to Sublette and Fremont Counties, growing up to a foot high on barren chalky hills, gravelly slopes, and fine-textured sandy-shaley draws between 6700 and 7200 ft AMSL. Tufted twinpod (*Physaria condensata*) is a small silvery flattened rosette-shaped member of the mustard family endemic to southwest Wyoming, which grows on sparsely vegetated sagebrush slopes and ridges between 6500 and 7000 ft (ibid.)

Invasive Plants and Noxious Weeds -- A total of 22 noxious weeds, including invasive species, are of concern in Sublette County, among them Canada thistle, musk thistle, black henbane, Dyer's woad, hoary cress (whitetop), perennial pepperweed (giant whitetop), Russian knapweed, spotted knapweed, leafy spurge, and perennial sowthistle. Both invasive and noxious plants already occur in the overall M3D as isolated infestations, with black henbane, perennial pepperweed, Canada thistle and Musk thistle known to be present in problematic quantities in the Soapholes area. Detailed information relating to these species is available through the Sublette County Weed and Pest Control office. Because invasive and noxious plants are typically very aggressive, special management is required in order to 1) prevent existing infestations from spreading (or to eradicate these infestations), and 2) prevent the introduction of noxious weed seed from outside sources.

G. Oil & Gas / Minerals -- Thirty-three wells have been drilled in the M3D project area. Location of these is depicted on Map 9, in the cumulative impacts portion of this EA. Most (\pm 28) have been plugged and abandoned. Specific data on oil and gas wells is available from the Wyoming Oil and Gas Conservation Commission via the internet at <http://wogcc.state.wy.us>. Oil and gas wells and other facilities on BLM lands are protected via standardized geophysical avoidance stipulations (H-3150-1 Handbook).

Approximately 110,954 ac (65%) of the M3D overlie Federal minerals administered by the BLM, 7193 ac (4%) within the project overlie State minerals, and 51,408 ac (30%) of the project overlie privately owned Minerals. Much of the northern half of the project consists of private surface overlying federally owned and managed minerals. Surface and mineral ownership within the M3D is depicted on Map 7. Mineral owners, among other things, have the right to lease or not lease their mineral holdings.

BLM has leased or has identified as available for lease most federal minerals in the M3D. (Pending issuance of an PRA RMP update, some areas in the northern portion of the M3D are withheld from leasing, as existing leases expire (PAPA pp. 34,35). The government leases grant to the lessee 'the right to use so much of the leased lands as is necessary to explore for, drill, for, mine, extract, remove and dispose of all the leased resource in a leasehold, subject to stipulations attached to the lease, restrictions deriving from specific non-discretionary statutes, and such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed' (43.CFR.3101.1-2, 10/1/01). Such reasonable measures may include but are not limited to modification of siting or design of facilities, timing of operations, and specification of reclamation measures (ibid.) The full regulations can be viewed at <http://www.access.gpo.gov/nara/cfr/index.html>. A lessee may conduct geophysical activities on his/her lease under sundry notice procedures, explicated at the BLM 3150 Manual and Handbook.

Map 7-- mineral status

THIS IS NOT AN ARCHVIEW MAP.

Approximately 95% of the federal minerals in the M3D are leased at this time. A similar percentage of private and State minerals are also leased at the present. It should be noted that mineral leasing is actively ongoing, so total acreage under lease can change from day to day.

H. Watershed and Water Resources -- The predominant water resources in the M3D project area are the Green River, North, South and Middle Beaver Creeks, Horse Creek, and Cottonwood Creek. Most of these perennial streams are located on or adjoin private land, as reflected on Map 1. Numerous canals and small irrigation ditches are fed by these streams, also located mostly on private land. Private lands also contain an unknown number of wells and stockwater ponds. Water resources on BLM lands in the M3D include some stretches of the above-listed perennial streams, and many range improvement projects (see livestock/range). Water wells, surface water, and riparian areas on BLM lands are protected by standard avoidance stipulations. Water needed for project drilling fluid will be procured via separate permit with the State.

I. Wastes (Hazardous/Solid) -- Two 'contaminated sites' (Stanley's Junction Food Mart and the Wyoming Highway Department facility, both of Daniel) are of record within the M3D area, according to DEQ Solid and Hazardous Waste 'sites' data available via the internet at <http://deq.state.wy.us>. Two solid waste facilities are also of record on the same database. A Type II Municipal Dump for the Town of Daniel is located in T34N - R111W, Section 23, but has been abandoned, reclaimed, and fenced off. A 'one-time-use-authorization' was given to the Antelope Run Ranch for T31N - R111W, Section 11. Use was authorized in 1994 for on-site treatment of petroleum-contaminated soils associated with a leaking underground storage tank. In October 1995, records indicate that the soil met treatment objectives and the material was used to reclaim the site (Patrick Troxel, DEQ Lander (307) 332-3047, personal communication). Landfills for individual ranches likely are present on private lands in the project.

As may be expected, hazardous materials are present in the project area in the form of oil well reserve pits, natural gas/oil pipelines, material transport containers on passing trucks, above ground fuel tanks at ranches, and fuel tanks in parked and moving vehicles. These materials, however, are contained and readily recognizable, and merit no further consideration here. Hazardous materials associated with oil and gas exploration and production activities are listed in the PAPA EIS ROD Appendix C. Material Safety Data Sheets (MSDS's) for all hazardous materials associated with the proposed M3D geophysical operations are maintained by Veritas' Project Manager Dave Newman (cell phone 303/886-5164), and are available for review upon request.

J. Socio-economics -- A detailed discussion of recent socio-economic conditions and trends for the Sublette County area is given in the PAPA DEIS (pp.3.2-12). Updated statistics are available at <http://eadiv.state.wy.us/i&e/sublette> and from the Wyoming Department of Employment.

In 2000, local government accounted for 21% of the total employment in Sublette County, while retail business accounted for 19%, services for 17%, construction for 12%, the oil and gas industry for 9%, agriculture and the federal government each for 4%, utilities, state government, and financial/insurance/real estate concerns each for 3%, manufacturing for 2%, and wholesale trade for 1% of total employment in the County. More specifically, the oil and gas industry employed 206 people in the County in 2000, and paid them an average annual wage of \$56,838, by far the highest average annual wage in the county, grouped by employer type (Pinedale Roundup, 9/5/02, p.1 after Wyoming Dept of Employment). The lowest average annual wage, \$12,729, was paid by the retail business (ibid.)

Sublette County and local government revenue (funds available for local infrastructure) is provided primarily by oil and gas. Historically 80-85% of county revenues have come from the mineral industry (PAPA DEIS p. 3-6), and in 2001, the oil and gas industry contributed over 91% of the property tax revenue (Pinedale Roundup 7/8/02, p. 2). This year approximately 89% of Sublette County's assessed property valuation is accorded to the oil and gas industry, with industrial property comprising 5%, residential property contributing 4%, agricultural land comprising 1%, and commercial and utility property each constituting less than 1% of the assessed valuation in the county (Pinedale Roundup, 9/5/02, p.6). A 1997 survey indicated that residents tended to believe that oil and gas would be more important than the hospitality or agriculture industry in Sublette County in the next 10 years (PAPA DEIS p. 3-5, after McLeod 1997). "Most residents understand that the federal State and private minerals have been leased and that development is going to occur. As a result, while expressing concern, very few residents have opposed continued natural gas exploration and development outright. Rather they plead for orderly and controlled development that preserves the values and natural characteristics most important to the area's quality of life." (PAPA DEIS p. 3-6)

The M3D area has not played a serious role in local energy development thus far, and scenic and recreational resources are the dominant economic value and public concern in the northern half of the project. Most land in the

northern project area is privately owned, often by absentee owners and/or summer residents who place high value on the lush river valley setting. Many of these surface owners do not control the minerals underlying their land (see oil & gas section of this EA). Real estate prices in the County, and certainly in the watered portions of the M3D, have gone up steeply over the past few years, and continue to rise, as vacation home buying expands from the Jackson area. Energy company staff expansion in the county (e.g., Shell Oil Company) is adding to the demand for housing. Sublette County's heritage is based on ranching, and overall it remains the predominant land use. Tourism and recreation account for a significant share of local employment and income, although statistics isolating this as an industry could not be found. A total of 15,388 recreation-use days are reported in the Pinedale Resource Area in 1995 (PAPA DEIS p. 3-23).

K. Air Quality -- Existing air quality for the M3D area is generally considered excellent, and is essentially the same as that described in the PAPA DEIS (pp. 3.36-40). Please refer to it for information on current air quality conditions. Air quality is administered by the Wyoming Department of Environmental Quality.

L. Recreation -- BLM's Warren Bridge campground (developed) and a portion of the Upper Green River Special Recreation Management Area lie within the M3D. Four 'other agency' recreation sites are also of record within the project boundary (PRA RMP ROD p. 38); project activities in these areas are subject to landowner avoidance and mitigation measures. Location of the Warren Bridge Campground and the Special Recreation Management Area are indicated on Map 8.

Recreational use in the overall project area centers on Fall hunting. Summer camping activities also take place, primarily in the Special Recreation Management Area and above-mentioned federal campgrounds. Rafting and shoreline fishing occurs within the M3D in the Green River, as well as in Creeks, and includes both individual use and commercial / outfitter guided trips. Warren Bridge is an important boat launch for personal and guided fishing trips on the Green River. Sage grouse, antelope, and mule deer are the primary species hunted in the M3D, however, some elk, waterfowl, cottontail rabbit, and limited quota moose hunting also occurs in the area. Season opening dates for rifle hunting are anticipated to be the busiest (Sept. 10 for antelope, Sept. 15 for deer and elk, Sept. 16 for sage grouse, and Oct. 1 for moose). Other dispersed recreational activities include mountain biking, hiking, and canoeing, and sightseeing.

On BLM lands in the M3D, off-road vehicle (ORV/ATV) is limited to existing roads. Further, to protect elk winter range and elk feedgrounds, even the use of existing roads and trails by these vehicles is prohibited by winter closures in two areas of the M3D, as shown on Map 2, and referenced in the wildlife sections of this EA (per PRA RMP ROD p.36).

In conjunction with Pinedale's historic Rendezvous celebration on the second weekend of July, the local Knights of Columbus annually sponsor an outdoor Catholic Mass at the 'Prairie of the Mass' site. At this time, BLM is not aware of any other recreational events planned within the project area (Martin Hudson BLM-PFO Recreation Planner, Dave Vlcek BLM-PFO Cultural Resource Specialist, personal communication).

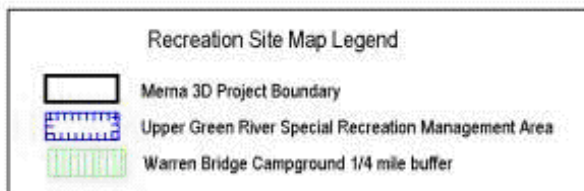
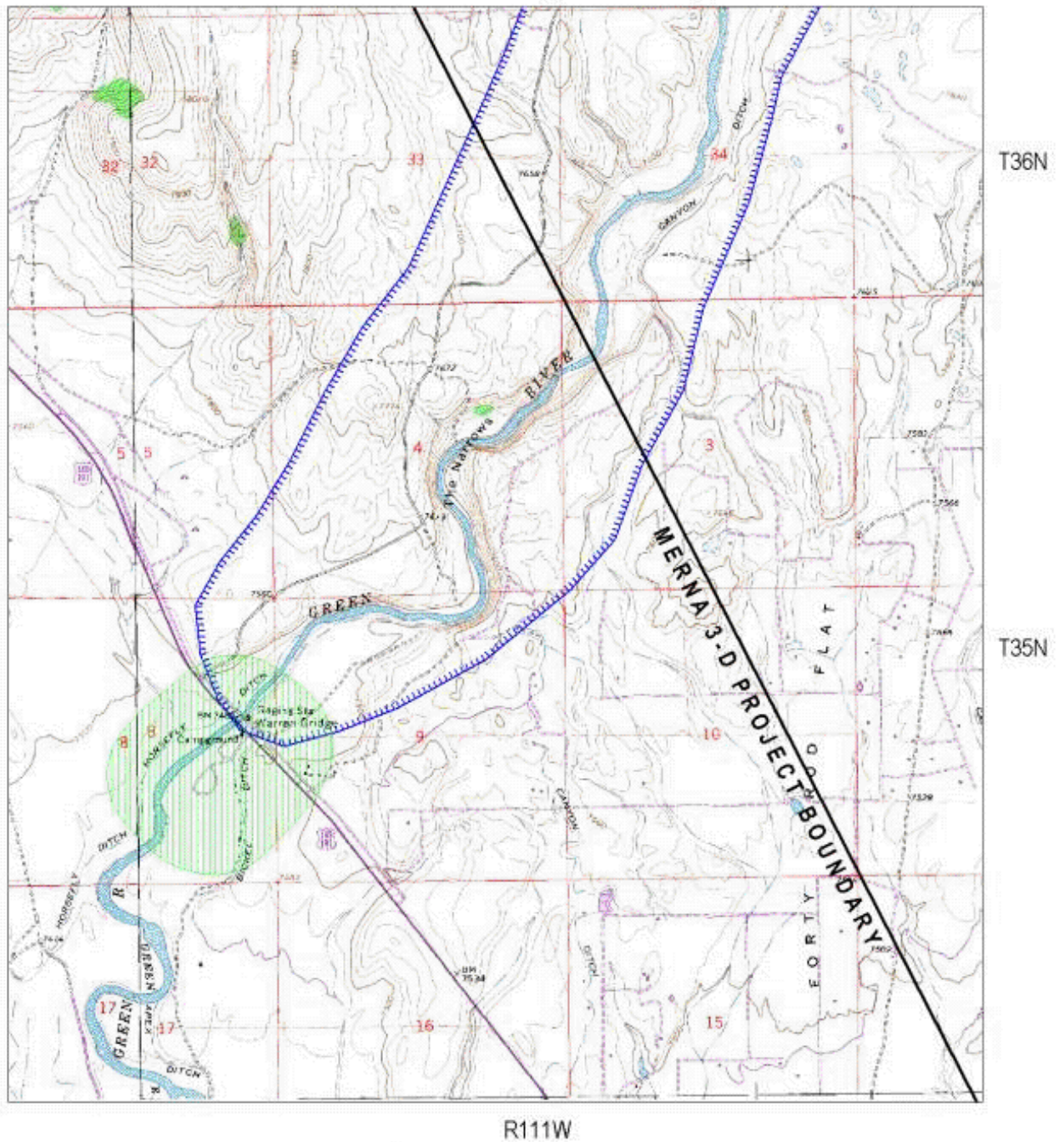
M. Residential Areas -- Within the M3D are 186 addressed structures, according to the Sublette County Courthouse (Pamela Curry, Sublette County GIS specialist, personal communication). Of these structures, 106 are rural residential improvements, according to Assessor Office records (ibid.) Areas of relatively dense housing within the M3D are located in the vicinity of Daniel and Forty Rod Flat, as reflected on Map 1 of this EA.

N. Paleontological Resources -- A check of the BLM's records shows that there is only one known paleontological site within the M3D area. This is a micro-vertebrate site located in the Red Hills, in T32N - R111W, Sections 29, 30, 32 and 33 (Frank Bain, BLM-PFO Geologist, personal communication).

O. Transportation Facilities/Public Safety -- U.S. Highway 189 (Big Piney to Daniel), U.S. Highway 191 (Pinedale west through Daniel and on toward Bondurant), State Highway 354 (Daniel to Merna), and numerous Sublette County roads run through the project area. Traffic load on these roads systems is extremely variable depending on time-of-day and season-of-year. Traffic on the highways is heaviest during daylight hours and during the summer and fall months, tourist and hunting seasons. Traffic on the county roads is typically also heaviest during daylight hours, but is more constant from season-to-season. Specific traffic numbers for the highways are available from WYDOT.

BLM Recreation Sites

No off-road vehicular traffic permitted year round



Veritas DGC Land, Inc.
Merna 3-D Seismic Project

P. Wild & Scenic River Systems -- A ca. 2 mile long segment of the Upper Green River within the M3D boundary has been evaluated as eligible and suitable for designation in the national Wild & Scenic River System (Jonas 2002). The segment, which extends upstream from Warren Bridge, has been identified as possessing outstanding scenic, recreation, historical, and wildlife values (ibid.) The BLM is planning to recommend designation of this River segment (Martin Hudson, BLM-PFO Recreation Planner, personal communication 7/2002). Interim management prescriptions for the area are still in preparation, and will be the same as for the Upper Green River Special Recreation Area (ibid.). Boundaries of the Wild & Scenic River segment management area and the UGRSRMA are identical.

ENVIRONMENTAL IMPACTS

The following discussion addresses anticipated impacts to resources, regardless of resource / land ownership; where the impact discussion does not specify BLM, state, or private land, the impact applies to all three. However, because the BLM has no direct jurisdiction over geophysical exploration on state or private lands, mitigation measures developed through this EA will apply **ONLY TO THE PUBLIC LANDS**, with the following two exceptions. Because the proposed action would be a federally permitted action, BLM responsibilities extend to 1) known cultural resource sites listed on, eligible, or potentially eligible for the National Register of Historic Places, and to 2) Threatened and Endangered species which may be affected by the proposed action, regardless of land ownership. Therefore, known listed/eligible/potentially eligible cultural resource sites on state and private land will be avoided, and BLM will impose mitigation to protect threatened and endangered species occurring on state or private lands.

Of note, the Terms And Conditions For Notice Of Intent To Conduct Geophysical Exploration (BLM Form 3150-4a) and the attached Special Terms and Conditions, both included at Appendix E, are hereby made part of this environmental assessment.

Environmental Impacts of Alternative 1 (Proposed Action)

Surface Impact Summary: For the purposes of this analysis, it is assumed that four buggy vibes will travel once along 80 percent of the source line length (1100 mi x 80% = 880 mi) and also on off-road access routes (est. 90 mi) for a total of approximately 970 linear miles of vibrator traffic. Buggy-drills and mini-drills would drive once along 18 percent of the source line length (1100 mi x 18% = 198 mi) and also on 42 miles of off-road access routes for a total of approximately 240 linear miles of ground drill travel. Heliportable drilling would account for the remaining 2% of project source points, with no associated terrestrial travel. Additionally, it is assumed that ATVs will travel all receiver lines (which total 790 linear miles) up to 10 times, for a total of 7900 linear miles of ATV travel. Note that these assumptions are based on the maximum travel estimate.

Based on the above figures, **3080** acres will be affected by M3D buggy vibe tire impacts (2 tires x 3.6 ft wide each x 4 buggy vibes in a side-by-side pattern = 29 ft wide impact area x 5280 ft per linear mile / 43560 sq ft per ac = 3.5 acres direct tire impacts per linear mile x 880 mi off-road buggy vibe routes = 3080 ac).

Some **209** acres of tire impact are anticipated from buggy-drill and mini-drill traffic (2 tires x 3.6 ft wide each = 7.2 ft wide impact x 5280 ft per linear mile / 43560 sq ft per ac = 0.87 ac direct tire impacts per linear mile x 240 mi off-road drill travel = 209).

An estimated **1438** acres would be affected by M3D ATV tires (2 tires x 0.75 ft wide each = 1.5 ft wide impact x 5280 ft per linear mile / 43560 sq ft per ac = 0.182 acres direct tire impacts per linear mile x 790 miles of off-road ATV traffic anticipated x 10 passes = 1438 ac).

Approximately **47** acres would be impacted by vibe pads (18,954 total source points x 80% = 15,163 vibe points x (4.5 x 7.5 ft) wide vibrator pads x 4 buggy vibes / 43560 sq ft per ac = 47 ac).

Approximately **13** acres would be impacted by drilling (18,954 total source points - 15,163 vibe points = 3791 drill points x 12 ft x 12 ft direct surface impact area / 43560 sq ft per ac = 13 ac). Note that the actual drill holes will be between 2 1/2 and 4 inches in diameter, but that the machinery and workers will trample an area ca. 12 ft by 12 ft in size.

The total of (3080 + 209 + 1438 + 47 + 13 ac =) **4787** acres of direct impact would comprise approximately 2.8% of the overall 169,555 acre area within the project boundary. Take note, for this **2.8%** direct (tire, vibe pad, and drill site) project impact to the land surface of the M3D will be utilized repeatedly in this EA..

A. Wildlife (Alternative 1)

Impacts: Wintering antelope and mule deer occupying open sagebrush areas which do not provide screening from activities such as the proposed geophysical operations could be adversely affected via animal displacement and added stress during their already stressful winter survival quest, if project activities were conducted in their crucial winter range areas between November 15 and April 30. A seasonal restriction prohibiting surface disturbance, activities or use in crucial winter ranges between these dates is prescribed by the PRA RMP ROD (pp.10 and 58), and will be applied to this project. With application of the antelope and mule deer crucial winter range avoidance prescription, no consequential impact to their wintering is expected.

Being more individualists, **moose** would not be similarly affected by project activities in their year-long/crucial winter range. Moose tend to occupy areas that typically would not be traversed by geophysical vehicles. Potential winter geophysical activity in the willows would generally be by a “shooter” on foot locating the pre-drilled shot-hole and detonating the subsurface charge. Also, cable crew members (on foot) would lay out and pick up the geophone cables. The proposed action on the ground in these limited habitat areas would consist of only very brief and localized pedestrian activities (not extended occupancy), and habitat damage by the project is anticipated to be negligible (also see mitigation measures for visual and vegetation resources). Low-flying project helicopter activity, however, could result in moose aggravation and displacement, particularly in the Horse Creek, Beaver Creek, and Green River drainages, where substantial moose concentrations can occur. With application of the moose habitat prescription below, however, the BLM, in consultation with WG&FD personnel, has concluded that no notable impact to wintering moose is anticipated (Keith Andrews, BLM-PFO, Douglas McWhirter, WG&FD-Pinedale). It should be noted that, as bands of habitat along perennial streams, virtually all moose year-long/crucial winter range within the M3D is privately owned and controlled.

If project activities are proposed within the Bench Corral and Franz Elk Feedground areas between November 15 and April 30, wintering elk could be disturbed. Surface occupancy of BLM lands in the **elk feedgrounds** is prohibited year-round (PRA RMP ROD pp.10, 12). The document also specifies that geophysical activities in elk feedgrounds are to be evaluated on a case-by-case basis and may be restricted if unacceptable impacts would occur to wildlife or other resources (ibid. p.16). Off-road vehicle use within the feedgrounds and adjacent winter range is limited to authorized personnel only between November 15 and April 30 (PRA RMP ROD pp. 16, 33, 35 and 63). With application of the feedground avoidance measure below, no such impact is foreseen.

Elk migrating toward the Bench Corral and Franz Elk Feedgrounds could be diverted onto nearby private lands, if the proposed project were conducted during their gathering period, typically early-mid November. Such displacement could result in stored crop damage (consumption of privately owned hay). Ranchers, and the WGFD through their reimbursement program, could thus suffer loss of time and money. Project activity in the vicinity of the Bench Corral feedground is planned to occur in September, so no conflict is foreseen here. Geophysical operations near the Franz Elk feedground would take place in late December, as the project is nearing completion. Considering the location of the Franz feedground at the northern project boundary and the related migration route from the Forest southward to the feedground, minimal conflict in this area is foreseen.

Migrating mule deer, and antelope to a lesser extent, could be displaced by project activities in their pathways during migration periods. Geophysical activities would likely coincide with some antelope and mule deer migration in the Ryegrass, Daniel, 40 Rod, and Warren Bridge areas. More specifically, some 3500- 4000 mule deer and antelope may be expected to pass through or just east of the M3D area north of Daniel during November and December, most of these en route from the Green River crossing northeast of Warren Bridge to Cora Butte to Trappers Point, and on southward (Sawyer and Lindzey 2000 p. 23 and Sawyer and Lindzey 2001, p. 10, 20, 24). Some big game migration activity may occur as early as late October (WG&FD letter at Appendix C). The distance and duration of any antelope and mule deer displacement would depend on the animals’ sensitivity to human activity. Cases have been documented where elk moved an average of 3/4 mile from shot-hole seismic disturbance in mixed cover vegetation (Gillin 1989). Because nearly all M3D activities would be transitory and would occur within very small areas at one time (via small groups of pedestrians or vehicles), migrating animals would likely move around the geophysical operations and continue toward their migration destination. No adverse impacts with migrating game are anticipated as a result of transient activity. The placement of specific activity areas in place for an extended period of time, however, should be made with care. With implementation of the facility placement measure below, impacts to migrating antelope and mule deer is expected to be minimal. Of note, migration corridors have not been identified by BLM for specific seasonal restrictions, and the majority of the Warren Bridge to Trappers Point stretch is located on private lands.

If present, **nesting bald eagle** could be disturbed if the proposed project were conducted between February 15 and August 15. A seasonal 1-mile radius buffer surface use restriction between these dates will be applied to this project (per PAPA EIS ROD p. A-19 and adaptation of T&E decision at PRA RMP ROD p.59). With implementation of the raptor nest inventory and seasonal restriction below, no consequential impact to nesting bald eagle is foreseen.

If present, **roosting bald eagle** could be disturbed if the proposed project were conducted between November 15 and March 15. With implementation of the eagle roosting inventory and avoidance prescription below (per PAPA EIS ROD p. A-19 and adaptation of T&E decision at PRA RMP ROD p.59), no important impact to roosting eagles is anticipated.

The project area does not provide habitat for **grizzly bears** and none are known in the area, so no effects to grizzly bear or their habitat are expected. Potential disturbance of distant hibernating grizzly bear by seismic testing noise is not anticipated. Based on past research conducted regarding impacts to denning bears by geophysical projects (e.g. Reynolds 1987, Amstrup 1993, Amstrup and Gardner 1994, Blix and Lentfer 1992, Linnell et al 1996), federal agencies in Alaska require avoidance of known dens by a maximum distance of one mile (Dick Shideler, Alaska Department of Game & Fish, personal communication, 7/2002). The M3D is sufficiently distant from suspected denning areas to conclude that no effect to denning bears is likely.

The project area includes potential habitat for **Canada lynx**, and members of this species have been documented within the project boundary in the past. No trees would be removed through the proposed M3D. Vehicle operations through or over-the-snow could create winter access trails for coyotes to reach forested areas. Coyotes use the same prey base species as Canada lynx. Note: Trails created through the snow by geophysical operations would be allowed to drift closed immediately after the recording operations are completed. To adequately assess the degree of project effects on Canada lynx, a biological assessment is needed covering lynx habitat portions of the project. With implementation of the formal Biological Assessment prescription (and any subsequent measures) stipulated below, no adverse effect to Canada lynx is foreseen.

Noise and activity associated with the proposed geophysical operations would cause **prairie dogs** to flee to their burrows while equipment is in close proximity. In view of the generally heavy textures of soils predominant in the project area, vehicular traffic are not expected to result in burrow failure. Burrow failure, however, may be a more likely result of vibroseis activity or shot-hole detonation. Should tunnel collapse occur, a prairie dog within the tunnel could be trapped or crushed. Of interest, data suggest that within approximately 6 months of completion of a 3D vibroseis project, impacts associated with the geophysical activity appear to have had positive effects on new burrow construction, as loosened soil along vehicle travel paths is attractive to some burrowing rodents (Thomas 1995). Accidental entombment, temporary displacement, and stress to small animals may occur, but long term impacts to small mammals are expected to be negligible. Concomitantly, impacts to small mammal predators, principally raptors, are also anticipated to be minimal.

In the event a prairie dog colony in the project area supports **black-footed ferrets**, and in the event that a ferret were within a tunnel that collapsed, it could be trapped or crushed. This scenario is highly unlikely. Still, to assure avoiding impacts to the endangered black-footed ferret, a prairie dog town inventory, followed by ferret inventory and mitigative measures as appropriate, would be required should source points be located near active prairie dog towns (per USFWS 1989 survey guidelines). If, however, all project source (shot and vibe) points are re-positioned to avoid all active prairie dog burrows by a minimum of 50 m, no prairie dog town or ferret inventory would be required. Receiver cables could be laid through the prairie dog towns (per communication with Audrey Taylor, USFWS-Cheyenne, 7/2002). With the implementation of the avoidance or phased inventory measures prescribed below, no effect to black-footed ferrets is foreseen.

The proposed operations could adversely affect **mountain plover nesting and rearing activities**, if conducted between April 10 through July 10. As the project is scheduled to occur in the off-season, negligible impact to mountain plover is anticipated. In the event the project schedule changes, the standard plover survey and avoidance measure below would apply.

Based on past records for the region, **whooping crane** are highly unlikely to occur in the project area, and would do so only incidentally during migration. The documented past whooping crane occurrence in the project area was either incidental stopping by migrating cranes or activity associated with the experimental re-introduction project at Grays

Lake, Idaho. Birds hatched and reared with sandhill cranes in Sublette County did not develop fidelity to this area. No effect or jeopardy to whooping crane or their habitat is therefore foreseen.

Gray wolf occur occasionally in and near the M3D, in association with artificially fed elk. No prime habitat for the wolf occurs in the project boundary, and their presence here is transient. It is concluded that the proposed action would result in no jeopardy to this experimental / non-essential population.

No **yellow billed cuckoo** are known for the project area, and suitable nesting habitat for them has not been identified. It is concluded that the proposed action, as modified via this EA, would result in no jeopardy to this candidate species.

BLM designated 'sensitive species' could be killed or their habitat damaged by project vehicles. The modified proposed action would avoid open water and riparian habitats, so no impact to fish, amphibians, waterfowl, or their habitat is anticipated. Nests of raptors, sage grouse, and other ground-nesting or sagebrush-nesting birds are protected via seasonal restrictions discussed and applied below. Among the potentially present 'sensitive' mammals, only the white-tailed prairie dog is known to live in the project area, and impacts to burrowing rodents as a result of the modified proposed action are expected to be minimal (also see prairie dog and ferret discussion below). It is concluded that no serious impacts to known sensitive species are foreseen.

(It should be noted that BLM sensitive species designation does not connote mandatory restrictions. Designation of these was designed to trigger general management measures such as inventory, conservation planning, and interagency information exchange regarding these particular species. BLM Wyoming State Office Instruction Memo WY-2001-040 imparting the sensitive species policy and list specifies that 'no otherwise lawful action or authorization of the Bureau should be delayed or denied pending completion of an inventory'. Therefore, no completed sensitive animal species inventory would be required for M3D project approval. Pursuant to the BLM policy, sensitive species have been considered in this NEPA analysis.)

Important **raptor nesting** could be disturbed if the proposed project were conducted during their nesting season. Raptor nests which have been occupied within the last 3 years are protected via seasonal inventory and avoidance restrictions from February 1 through July 31 (PRA RMP pp.10, 59), except bald eagle which are discussed under 'Threatened and Endangered Species'. With implementation of the inventory and avoidance prescription below, no vital impact to nesting raptors is foreseen.

The proposed operations could adversely affect **sage grouse** strutting, nesting, and rearing activities if conducted during this sensitive period. Seasonal restrictions requiring field evaluation and prohibiting surface use between March 1 and July 31 is prescribed by existing decisions (PRA RMP ROD maintenance action, and will be applied to this project. With implementation of the sage grouse lek and nesting inventory and seasonal avoidance restrictions, no notable impact to strutting, nesting and rearing sage grouse is foreseen.

Vehicular traffic through taller stands of sagebrush could fragment wildlife corridors and damage **thermal cover** utilized by wintering wildlife. With implementation of the tall brush avoidance measure, however, no impacts to wintering wildlife, including grouse, or their cover is expected.

As a consequence of project off-road vehicular traffic, a broad-based but minor and short-term reduction in woody brush is anticipated in the sagebrush-dominated portions of the M3D, affecting big game winter browse and sage grouse nesting habitat. (Projected impacts to vegetation are described and quantified in the vegetation section of this EA, which see.) Where woody brush plants are killed by vehicular traffic, similar past projects in the Pinedale Field Office Area have demonstrated that grass remains, and younger more succulent forbs and brush plants reoccupy the travel paths within a few years.

With regard to this vegetative effect, it should be recognized that small scale, mosaic pattern, brush-killing in decadent stands of sagebrush is actively encouraged as a means of **habitat improvement** for sage grouse, mule deer, and antelope (e.g., WG&FD Habitat Bulletins and PRA RMP ROD pp . 21-23). Sage grouse habitat guidelines, for example, indicate that in areas of old, decadent sagebrush or continuous stands of dense sagebrush, limited sagebrush treatment may be beneficial to this declining species. Treatment should consist of an irregular pattern of localized patches or narrow strips; total kill of sagebrush should be avoided. Treatment of such localized patches or narrow strips over a period of years promotes uneven aged stands of sagebrush, thus increasing habitat diversity.

Irregular mosaic treatment patterns provide more edge-effect, and thus more benefit to sage grouse, as well as being more natural looking and visually pleasing. Widths of treated areas should be no wider than 30 yards, and untreated areas should remain at least as wide as treated areas. Chaining or other mechanical means are preferred over spraying for sagebrush treatment, since forbs are not killed (WG&FD Habitat Extension Bulletin No. 31, n.d). Prescribed burning, chemical applications, chaining and brush hogging are on-going by various agencies to kill woody plants in an effort to improve wildlife habitat. With implementation of the spread out vehicle pattern (see mitigation measures for visual resources) the proposed geophysical project would appear to somewhat accomplish these habitat improvement tasks. Impacts to brushy vegetation may be beneficial to wildlife habitat in the long term, albeit on a very small scale.

Geophone cable deployment and vehicle traffic will cause animals to flee the immediate site of these human activities. This **displacement of wildlife**, however, would be brief and localized, as small scale transitory activities are spread over multiple small sites within the project area. Overall, with implementation of the seasonal restrictions protecting sage grouse, big game, ground-nesting birds, and raptors during the more sensitive wintering and birthing/rearing seasons, no consequential impact to wildlife is foreseen as a result of activity disruption.

The projected sagebrush kill would occur in narrow bands. Where the paths pass through decadent sagebrush stands, the sagebrush loss would be analogous to a thinning/regeneration project and would be a potential long-term benefit to wildlife as new, higher protein, more succulent sagebrush plants reoccupy the area.

Mitigation: To avoid adverse effects to wildlife, the following mitigation measures would be applied. All seasonal wildlife restrictions pertinent to the project area are listed below, even though some measures are irrelevant for the M3D project as currently scheduled.

Geophysical operations will not be allowed on antelope crucial winter range, mule deer crucial winter range, elk winter range, or elk feedgrounds from November 15 through April 30 (PRA RMP ROD pp. 10 and 58). Modifications to this limitation may be applied for in writing to the BLM Pinedale Field Office.

No geophysical operations (helicopter, pedestrian, or land-vehicle) are permitted within a half mile of the Franz elk feedground during elk occupation, approximately Nov 1- April 30.

Between November 15 and April 30, moose crucial winter range willow riparian habitat areas (especially along Horse Creek, Beaver Creek, and the Green River) should be avoided to the extent practicable, by 1) minimizing helicopter overflights, 2) raising any overflights which are necessary to an altitude of at least 300 ft, and 3) hand-laying receiver lines (PRA RMP ROD pp. 10 and 58 modification/adaptation, and WG&FD letter of 7/8/02).

To avoid conflict with antelope and mule deer migration routes, particularly heavily used migration corridors, final selection of stationary project activity areas (recording truck, staging, and heli-pad areas) on non-federal land will be made by Veritas in consultation with the BLM Authorized Officer and WG&FD. (see EA map 3 and WG&FD letter of 7/8/02 in Appendix C)

If project field activities are proposed for the period between February 1 through August 15, Veritas shall provide BLM with a current active raptor nest survey of areas to be affected during this period. From February 1 through May 31 (nest selection period), geophysical operations shall not be allowed on BLM-administered lands within a 0.5 mile radius of raptor nests occupied this year or within the last 3 years, except for ferruginous hawk nests for which the seasonal buffer is 1 mile. From June 1 through July 31 (rearing period), geophysical operations will not be permitted on BLM-lands within a 0.5 mile radius of occupied raptor nests, except ferruginous hawk nests, for which the seasonal buffer is a 1.0 mile radius. Modifications to this limitation may be applied for in writing to the BLM Pinedale Field Office. (adapted from PRA RMP ROD p. 59)

Seasonal restrictions for occupied bald eagle nests apply from February 15 through August 15, with a 1.0 mile radius buffer zone (per PAPA EIS ROD p. A-19 and adaptation of T&E decision at PRA RMP ROD p.59). Bald eagle nest avoidance requirements apply to both federal and non-federal lands.

If project field activities are proposed for the period between November 15 through March 15, Veritas shall provide BLM with a bald eagle winter roosting survey of potential roost areas to be affected during this period (per PAPA EIS

ROD p. A-19 and adaptation of T&E decision at PRA RMP ROD p.59). Bald eagle roost avoidance requirements apply to both federal and non-federal lands.

Veritas shall provide the BLM with a Canada Lynx Biological Assessment report for the aspen and lodgepole pine forest cover types in T36N, prior to any activity in that area. (See EA Map 6). The Assessment must be prepared by a qualified biologist, and address all potential project impacts to Canada lynx or their habitat. Based on report review, the BLM in consultation with the USFWS will determine the need for any additional measures which would be applied before approval of that project increment (adaptation of T&E decision at PRA RMP ROD p.59). This stipulation applies to both federal and non-federal lands.

During project survey/staking, Veritas surveyors shall identify and indicate on a map all prairie dog burrows/mounds found along or within the proposed source and related travel routes (adapted from PRA RMP ROD p. 59). Note that this stipulation applies to both federal and non-federal lands.

Veritas surveyors shall locate all source points at least 50 m (150 ft) from all prairie dog burrows/mounds. Receiver cables and geophones may be placed within the prairie dog towns. Note that this stipulation applies to both federal and non-federal lands in the project.

Should the operator wish to place source points closer than 50 m to an active prairie dog burrow, Veritas shall provide BLM with a prairie dog town inventory report covering all areas within 5 miles of the colony to be impacted, per USFWS Ferret Inventory Guidelines (USFWS 1989). Note that this stipulation applies to both federal and non-federal lands. Based on the prairie dog town inventory report, the BLM Authorized Officer shall determine whether any areas meet black-footed habitat criteria.

Should prairie dog colonies/complexes in the project area meet ferret habitat criteria, Veritas shall use a qualified biologist to conduct a black-footed ferret search per established guidelines (ibid.). Daytime/snow searches for ferret sign may be conducted from December 1 - March 31 and nocturnal ferret searches may be conducted from July 1 - October 31. If a black-footed ferret or its sign is found, all action potentially affecting the colony/complex shall cease, and further action will be subject to USFWS guidance and/or restrictions (ibid.). This stipulation applies to both federal and non-federal lands.

If activities are proposed to be conducted between April 10 through July 10, the geophysical operator shall provide BLM with a current mountain plover survey report covering all areas to be affected during this period (adapted from PRA RMP ROD p.59 and USFWS 2002 mountain plover guidelines). Note that this stipulation applies to both federal and non-federal lands. Operations will not be allowed within 100 meters of active mountain plover nests.

If activities are proposed to be conducted between March 1 through May 15, the geophysical operator shall provide BLM with a sage grouse lek survey report covering all areas to be affected during this period (per PRA RMP ROD pp. 10, 59 and related maintenance actions). Current lek / nesting survey data addressing parts of the M3D project area should be utilized as much as possible, and is available at BLM.

Geophysical operations will not be allowed within one-half mile of active leks between midnight and 9:00 am from March 1 through May 15.

If activities are proposed to be conducted between April 1 through July 31, the geophysical operator shall provide BLM with a sage grouse nesting survey report covering all areas to be affected during this period (per PRA RMP ROD pp. 10, 59).

Geophysical operations will not be allowed on BLM-administered lands from March 1 through July 31 within a two-mile radius of active sage grouse leks (per PRA RMP ROD pp. 10, 59 and PAPA EIS ROD p. A-19). Exception to this restriction may be applied for in writing to the BLM Pinedale Field Office.

All off-road-vehicle operations are prohibited from April 1 to July 31, to prevent occupied nests and fledglings of ground-nesting birds, including sage grouse, from being crushed. Modifications to this limitation may be applied for in writing to the BLM Pinedale Field Office. An exception may be granted if the geophysical operator ensures that all

vehicles driving off road are preceded by a pedestrian 20-50 ft ahead during this period.

To protect wildlife cover, vehicle traffic shall, where practicable, avoid stands of tall sagebrush. Stands of tall sagebrush are defined as areas in which the majority (more than 50%) of sagebrush plants are 2 ft or taller.

B. Cultural Resources (Alternative 1)

1) Historical and Archeological Resources

Impacts: The proposed seismic exploration could cause impacts to sites eligible for the NRHP, which are protected by the National Historic Preservation Act. These effects could be in the form of direct, indirect or cumulative impacts. Direct impacts are physical, and can adversely affect the site or its setting, such as from vehicle traffic during geophysical field operations. These impacts would consist of formation of two-track trails, surface soil displacement or soil compaction. If exploration activities are carried out in wet weather, rutting could occur. Indirect effects would occur through creation of trails which might be used by recreationists and which could stimulate erosion. The trails themselves could affect the setting of sites for which viewshed is a component of site significance. By providing access into areas containing sites, public use could result in artifact collection which could radically change site interpretations and result in the loss of important scientific information. Cumulative effects would consist of a gradual degradation of the cultural landscape through erosion and illicit artifact collection. However, with the implementation of the standard mitigative measures prescribed below, no effect to significant cultural resources is foreseen.

Of note, Fort Bonneville and the Prairie of the Mass site are protected by no surface occupancy (NSO) federal mineral lease stipulations (PRA RMP ROD p.12 [Map 3]). The document specifies that geophysical activities in NSO areas including cultural sites will be evaluated on a case-by-case basis and may be restricted if unacceptable impacts would occur (ibid. p.16). With implementation of the inventory and avoidance prescriptions below, no adverse effect to these sites is foreseen.

Mitigation: Veritas shall provide a Class III cultural resource inventory for all public lands where off-road vehicle travel will occur. The inventory shall cover 50 feet either side of the centerline of off-road travel routes, for a total inventory coverage of 100 feet. Such inventory will not be required for areas covered by previous inventories, provided those inventories meet current standards. The cultural resource inventory will be designed to locate and prescribe avoidance routes or other mitigation for all significant or unevaluated sites, previously recorded as well as newly discovered. Standard site avoidance entails a 30 meter (100 foot) buffer zone around all eligible and unevaluated sites. Sites determined by BLM to be ineligible for nomination to the NRHP require no further action.

Veritas's archeological consultant shall obtain a cultural resource files search print-out from the SHPO Cultural Records Office shortly before commencing fieldwork. Based on this, the consultant will identify previously recorded significant and unevaluated cultural resource sites on federal and non-federal lands in the project area. Using site form copies obtained from SHPO, the consultant will plot these sites onto the M3D project map for Veritas, who is requested to arrange avoidance for these properties.

Off-road buggy, bike and drill traffic on BLM land shall be confined to a corridor 100 ft wide (50 ft either side of centerline) along travel routes lines which have been inventoried for cultural resources (refer to archeological inventory map).

No vehicle operations shall be conducted on any found segments of the Opal Wagon Road. These segments shall be avoided by the standard 30 m buffer zone. Project vehicles may cross segments of the Wagon Road only at existing two-track or improved road crossings, or other areas of disturbance.

Veritas shall prepare a specific plan of operations regarding activity within the Green River Rendezvous National Historic Landmark (NHL), which lies on private land. After the plan has been approved by the owner(s) of the NHL, the plan shall be submitted to the BLM Authorized Officer for review, at least 2 weeks prior to field operations in that area. BLM will consult with the SHPO, NPS, and ACHP as appropriate, and append special conditions of approval to this NOI as necessary to protect the National Landmark.

2) Native American Religious Concerns

Impacts: Indian Sacred Sites, as defined and protected by E.O.13007, could suffer impacts by adversely affecting their physical integrity or by interfering with their ceremonial use. With implementation of the avoidance measure listed below for sites of potential Native American religious concern, however, the project should cause no adverse effect to these locales. Note: There are currently no known Indian Sacred Sites in the M3D.

Mitigation: All cairn and 'tipi ring' sites shall be avoided by 300 ft. All Traditional Cultural Properties, rock art and unusual rock alignment sites (such as altars or medicine wheels) shall be avoided by 0.25 miles. All burial grounds shall be avoided by 1 mile. Within these avoidance buffers, vehicular traffic is permitted on existing roads. Off-road travel is limited to pedestrians. Geophone cables may be hand laid through these areas by pedestrians.

C. Soils (Alternative 1)

Impacts: Impacts to soils in the form of compaction and gully erosion could be created, principally by the proposed off-road heavy vehicle traffic. Compaction reduces capacity for soils to absorb moisture, and results in reduced root growth and plant vigor. Off-road vehicle operations would also crush, and to a lesser extent break off, much of the above-ground vegetation, but root masses of grass and forbs remain live and intact and continue to hold soil in place, reducing or avoiding erosion. Soil disturbance from this project would be generally similar to disturbance associated with chemical vegetative treatment projects, as described in the Big Piney/LaBarge Coordinated Activity Plan Environmental Assessment (BP-LaB CAP EA p.73), which predicts soil loss rates up to 1/2 ton per acre per year. By off-setting individual vehicle drive paths (see mitigation measures for visual resources), however, soil compaction and erosion, as well as long-term vegetation damage will be minimized. Consequently, compaction and soil erosion on level and gently sloping surfaces is anticipated to be minimal. Vehicle tire impacts would occur on 2.8% of the total surface area encompassed by the project.

Soil loss would generally be higher on sparsely vegetated slopes over 25 percent. BLM guidelines state that 'surface disturbance will be restricted' ... on ... 'slopes in excess of 25%' (PRA RMP ROD p.58). With implementation of the 25% slope restriction prescribed below, the M3D should result in minimal impacts.

Impacts to soils may also occur as a result of surface rutting caused by vehicle operations on wet soils. BLM guidelines state that surface disturbance will be restricted when soil material is saturated... (PRA RMP ROD p.58). With implementation of the saturated soil restriction prescribed below, the project should cause minimal impact in this regard.

Impacts to soils could occur as a result of surface rutting and vehicles bogging down on alkaline soils in Soap Holes Basin. BLM guidelines state that surface disturbance is to be minimized in the 20,000 ac Soap Holes Basin area (PRA RMP ROD pp. 10, 19, 20). With implementation of the alkaline soils restriction for Soap Holes Basin prescribed below, the project should cause minimal impact in this regard.

Mitigation: No vehicle operations (buggy vibes, recorder trucks, pickups, ATVs) will be allowed on slopes of 25 percent or greater.

The operator shall conduct **no** vehicle operations during periods or in areas of saturated ground when surface rutting could occur.

On boggy alkaline soils in the Soap Holes Basin, Veritas will utilize buggy drills with full flotation tires and will hand-rake the ground surface to approximate original contour and appearance within 5 days of drilling each shothole.

D. Livestock/Range (Alternative 1)

Impacts: Project operations would involve numerous fence crossings. Leaving fences down or gates open when livestock are present may result in livestock moving between pastures, from private to public land or vice versa, and herd mixing. This could lead to unauthorized grazing, overgrazing or increased livestock operator cost associated with sorting mixed herds. With implementation of the fence and lessee notification measures prescribed below, the project should result in negligible impacts.

Seismic activities operations in close proximity to developed water (water wells or water impoundments) could result in casing failure and a subsequent loss of livestock water. With implementation of the water restrictions prescribed below, the project should result in no serious impacts. (Other types of surface water are addressed under Water in this EA.)

Heavy vehicle traffic could cause damage to existing cattleguards. With implementation of the facilities identification and repair/replacement responsibility measures prescribed below, the project should result in no consequential impacts.

The proposed action would result in short-term vegetative disturbance on approximately 2.8% of the project area (see vegetation impacts). This disturbance would consist primarily of conversion of up to ca. 50% of the mature shrubs and forbs in the tire paths to grass and younger, more succulent shrubs and forbs. While species and age make-up of plants in the tire paths would change, available palatable livestock forage would not be appreciably affected. With side-by-side vehicle travel paths (see mitigation measures for visual resources), livestock forage impacts in the medium and long term are anticipated to be minimally beneficial. Owing to dry vegetative conditions associated with Fall, grass in the vehicle traffic paths will in many cases be broken off, with re-growth not anticipated until next Spring, constituting a minor and very short-term loss of usable feed.

Livestock Water Discussion: The PRA RMP ROD (BLM 1988) restricts surface disturbance within 500 ft of surface water and/or riparian areas (p.58). Water wells are not specifically addressed in the RMP as regards surface disturbance buffer zones, but these have generally been treated with the same restrictions as for surface water (Doug Powell, BLM, personal communication 6/2001). The PRA RMP ROD also provides that modifications of the surface disturbance mitigation guideline may be approved in writing by the Authorized Officer (ibid.).

State of Wyoming Oil & Gas Conservation Commission Rules and Regulations Chapter 4, Section 6.r.1 prohibits shot-hole operations within one-quarter mile of any water well or flowing spring, unless written permission is received from the surface owner (WOGCC p. 4-23). No off-set requirements have been made by the State regarding vibroseis points.

'Recommended safe distances' from seismic source points to facilities including water wells have been established by BLM since RMP issuance, presented in Illustration 10 of the H-3150-1 Handbook for Onshore Oil and Gas Geophysical Exploration (BLM 1994). The recommended safe distance for vibroseis operations is 300 feet. The recommended safe distance for shot-holes is presented in tabular form, varying with the amount of charge and the depth of the drilled hole. The H-3150-1 Handbook specifies that if the BLM or any interested party wishes to modify the buffer distance presented in the Handbook, the burden of proof to justify the necessity of an increased distance or the safety of a decreased distance is the responsibility of the party wishing to make the change (ibid.) The U.S. Forest Service utilizes these same safe shot-hole distance and burden of proof standards (USDA-USFS 1996).

In consideration of the activity-specific (geophysical) guidelines and policy promulgated by BLM via the H-3150-1 Handbook, the less restrictive Handbook buffer prescriptions will be applied to the proposed project. The following provisions, thus, constitute written exception to the 500 feet water avoidance buffer prescribed by the PRA RMP ROD and written surface owner permission as regards WOGCC requirements.

Heavy vehicle traffic could damage hayfields, resulting in crop loss and reclamation costs, and damage irrigation ditches, resulting in repair costs. Private landowners control the irrigation facilities and hayfields, and will be responsible for their own mitigation measures. Note: Operations are scheduled to be conducted in the Fall after the hay has been harvested. Consequently, the project should result in no impacts to irrigation systems or hayfields.

Mitigation: Veritas shall notify grazing lessees prior to entering upon their allotments. Addresses of affected grazing lessees will be provided by BLM.

Veritas shall make every effort to avoid disturbing or altering fences. Gates shall be used when possible. Gates must be closed immediately after passing through them. If a fence must be crossed, it shall be let down or cut (as determined by the owner), crossed, and immediately put back up. The wires shall be stretched to the original tension

from the nearest brace or gate panel.

To protect water developments, vibroseis source points shall be located a minimum of 300 ft from all water wells and dammed reservoirs. Shot-holes shall be located from these same facilities no closer than 300 ft, or the distance prescribed in H-3150–1 Illustration 10, p.2. (distance dependent on charge and depth), whichever is more.

Any facilities damaged, destroyed or removed in connection with this geophysical exploration operation shall be immediately restored to original condition or replaced with a similar facility.

E. Visual Resources (VRM) (Alternative 1)

Impacts: Concentrated (vehicle-behind-vehicle) off-road vehicle traffic could cause long linear obtrusions (i.e., two-track roads) across the landscape. Since 1992, the BLM Pinedale Resource Area / Field Office has required spread out/off-set geophysical vehicle operations such that the tires of one vehicle did not follow in the path of another, to avoid linear visual obtrusions, to reduce soil compaction, and to reduce the degree of vegetation loss. The approach has been successful and the procedure has since been widely adopted on BLM lands in Wyoming. With this vehicle off-setting system (see mitigation measure below), visual impacts are anticipated to be low level and short term.

Mitigation: The geophysical operator shall off-set side-by-side all off-road vehicle traffic over a 50-foot wide swath on either side of the planned travel route centerline, so that one vehicle does NOT drive the same path as another vehicle.

F. Vegetation (Alternative 1)

Impacts: The M3D is not expected to result in any long-term or permanent loss of vegetation. It would, however, result in direct vehicle traffic / impacts on ca. 4787 acres of land, or 2.8% of the project area. Refer to the description of the proposed action for details on the calculation of this acreage. Proportionate to land ownership, approximately 40 percent of these vegetative impacts would occur on BLM-administered land, 5 percent would lie on State land, and 55 percent would occur on private lands.

Acres of anticipated direct project vehicle impact / brush crushing effects are summarized on the following Table.

M3D Direct Impacts by General Vegetative Cover Type

Primary Vegetation	%	Total
Wyoming big sagebrush	43%	2050 ac
Irrigated hayland	31%	1480 ac
Mountain big sagebrush	19%	910 ac
Shrub-dominated riparian	4%	190 ac
Aspen forest	2%	96 ac
Basin bare rock and soil	1%	48 ac
Lodgepole pine closed forest	<1%	14 ac
	100%	4787 ac direct impact

It has been observed on previous geophysical projects using the spread-out vehicle pattern that woodier plants are sometimes severely affected, but that the (more tender and resilient) grasses and forbs survive and continue to vegetate the vehicle paths. Brush kill is a function of multiple factors including brush type, amount of traffic, time of year, and moisture conditions. Based on observation of past 3D projects in areas of the relatively tall Mountain Big Sagebrush, approximately 50 percent of the sagebrush driven over would be killed, and another 20 percent are partially killed, or "pruned". In environments where relatively low-growing Wyoming Big Sage, Low Sage, or Black Sage predominates, brush kill is less, with approximately 30 percent of the sagebrush which is driven over killed, and another 20 percent partially killed / damaged.

Using these figures, an estimated $(2050 \times 30\%) = 615$ acres of Wyoming big sage would be killed, another $(2050 \times 20\%) = 410$ acres damaged, and an estimated $(910 \text{ ac} \times 50\%) = 455$ acres of Mountain big sage would be killed, with another $(910 \times 20\%) = 182$ acres damaged.

Vehicle impacts to grasses and forbs are anticipated over the same area as the brush impacts (with the affected area constituting 2.8% of the overall project area). Impacts to these species would be very short-term in effect, as grasses and forbs are not killed by vehicle traffic, and will resprout from their established root systems. Grasses and forbs comprise the majority of vegetation within sagebrush and shrub-dominated riparian communities, and overwhelmingly dominate the hayfield and pasture regimes. Owing to dry vegetative conditions associated with Fall, grass in the vehicle traffic paths will in many cases be broken off, with re-growth not anticipated until next spring. Effects to vegetation in irrigated and subirrigated hayfields and pastures is anticipated to be negligible, occurring after the growing season and harvest; some 30 percent of the project impacts are projected to fall on this vegetative cover type.

Approximately 2.3% (110 ac) of the M3D would occur in forested areas. Heliportable drilling is proposed for forested areas where source points can not reasonably be off-set to non-forested locations. This would virtually eliminate impacts to lodgepole and aspen forest vegetation. Standard Conditions of Approval require that no trees be cut, and this measure would be applied.

Shrub-dominated riparian areas, particularly willow stands, will be substantially avoided by buggy vibration traffic. Vehicular impacts to the vegetation of riparian areas are anticipated to be minimal, considering the flotation-tired drill buggies proposed for use in such areas, coupled with the fact that drill buggy operations involve only one buggy at a source point. Vegetation regrowth in riparian conditions is quick.

In sum, vegetative impacts of the project would consist principally of sagebrush thinning within 2.8% of the sagebrush-dominated (ca. 62%) portion of the project. Vegetative changes in these areas would consist of a proportional shift in the extant vegetative community, with no new plant species introduced. Hayfields, riparian bottoms, forested stands, and bare ground areas are not anticipated to receive appreciable impact. Overall, M3D vehicle traffic impacts to general vegetation are expected to low level and short term, and minimal.

Relatively steep slopes have been identified as being of special concern regarding 'sensitive' status plants; such slopes contain potential habitat for the subject 'sensitive' species, and these areas are more susceptible to tire damage (via friction and subsequent erosion). Also, plants with 'sensitive species' status could be killed or their habitat damaged by ground surface disturbance, such as by vehicles wallowing on muddy surfaces. With implementation of the saturated soil restriction (see mitigation measures for soils), and the slope restriction (see mitigation measures for visual resources), the M3D project should result in no serious impacts to sensitive plant species or their habitat.

Noxious weed species could be introduced to the project area, and/or spread about from within the project area via the diffusion of seed. With the implementation of the vehicle washing prescription below, the project should result in minimal impacts in this regard.

Mitigation: No trees may be cut or broken. Vehicles may not drive on or over willows.

The geophysical operator shall reclaim and reseed any areas where their operations have caused unplanned surface rutting or have otherwise removed all of the surface vegetation, as directed by the Authorized Officer.

To prevent the introduction of new weeds, the geophysical operator shall thoroughly power-wash all field vehicles (buggy vibes, pick-ups, ATVs, etc), particularly their undercarriages, before transporting them to the project area. To quarantine an area of the Soapholes with weed problems, any vehicle associated with the project and working between Highway 189 and the Green River, north of Cottonwood Creek and south of Grindstone Butte, shall be thoroughly washed before entering and before leaving this area. Approved exit points from the described area are located at the intersection of Hwy. 189 and Sublette County Road 146 and the intersection of Hwy 189 and Sublette County Road 147. Equipment washing shall occur at or near these approved exit points. This stipulation applies to all vehicles driving off-road within this area.

G. Oil and Gas /Minerals (Alternative 1)

Impacts: Vibroseis operations near existing buried pipelines and oil / gas wells could result in transmission interference or facility breakage. With implementation of the safe distance prescription below (per the BLM H-3150-1 Handbook), no impact to these facilities is foreseen. Unanticipated damage to existing facilities of any kind is addressed under livestock grazing mitigation measures.

Selection of this alternative would allow project participants (mineral leaseholders) to obtain and utilize 3D geophysical data, resulting in the greater likelihood of drilling producing wells, more efficient development of their lease holdings, and would be consistent with the National Energy Policy.

Mitigation: Vibroseis source points shall be located a minimum of 300 ft from oil /gas wells and pipelines, unless written permission to encroach closer has been given by the owner/operator. Shot-holes shall be located from these same facilities no closer than 300 ft, or the distance prescribed in H-3150–1 Illustration 10, p.2. (distance dependent on charge and depth), whichever is more.

H. Watershed and Natural Water Resources (Alternative 1)

Impacts: Floodplains will be traversed by project operations, but no effects to these are anticipated, in view of the transitory nature of project activity and the low-level of ground surface alterations associated with this type of undertaking. Impacts to the watershed in the project area would include those addressed in the soils and vegetation impact sections of this EA.

Seismic source operations near any springs or seeps in the project area could disrupt the subsurface fissure, thus restricting or eliminating water flow. State of Wyoming Oil & Gas Conservation Commission Rules and Regulations Chapter 4, Section 6.r.1 prohibits shot-hole operations within one-quarter mile of any flowing spring, unless written permission is received from the surface owner (WOGCC p. 4-23). No off-set requirements have been made by the State regarding vibroseis points. BLM policy has established that the recommended safe distance for vibroseis operations (from springs and other features) is 300 feet (BLM H-3050-1 Handbook). The recommended safe distance for shot-holes from these same features is presented in tabular form, varying with the amount of charge and the depth of the drilled hole. The guidance specifies that if the BLM or any interested party wishes to modify the buffer distance presented in the Handbook, the burden of proof to justify the necessity of an increased distance or the safety of a decreased distance is the responsibility of the party wishing to make the change (*ibid.*) The U.S. Forest Service utilizes these same safe shot-hole distance and burden of proof standards (USDA-USFS 1996). In consideration of the activity-specific (geophysical) guidelines and policy promulgated by BLM via the H-3150-1 Handbook, the less restrictive Handbook buffer prescriptions will be applied to the proposed project. With implementation of the spring avoidance measure below, no adverse effect is foreseen.

Vehicular traffic through bodies of water, riparian or wetland areas could result in a temporary increase in turbidity (water quality deterioration). With application of the saturated soils restriction (see mitigation measures for soils) and the flowing water avoidance prescription below, actual impacts are expected to be negligible. No vehicular crossings of water bodies are planned at this stage, and if any are proposed, these would be very limited and would be on private or State land (Mike Dighans, Veritas, personal communication 6/2002). On non-federal lands, project activities are controlled by the landowner, but, given the project type and proposal, serious impacts to water bodies or riparian areas are not foreseen.

Impacts to groundwater could occur as a result of unplugged or improperly plugged drill holes. Veritas, however, is required by the Wyoming Oil & Gas Conservation Commission to plug all drill holes to State standards. WOGCC requires that all drill holes into or through water-bearing zones be plugged with bentonite to seal the zone and prevent contamination. No impact in this regard is therefore foreseen.

Water used for drilling fluid would contribute to depletion. The amount needed, however, is small, and water would be obtained from local permitted commercial water haulers or from irrigation ditches on private land after procuring appropriate State of Wyoming and landowner permits, per the Veritas plan of operations. Therefore, no unappropriated or unforeseen water depletion would result from project activities.

Discussion: The PRA RMP ROD generally prohibits surface disturbance within 500 ft of surface water and riparian areas (pp. 10, 58), with the guidance that measures be applied as appropriate (*ibid.* p. 8). Surface disturbance is

defined as characterized by the removal of vegetative cover and soil materials (ibid.). Because the proposed geophysical exploration project is not a vegetation denuding event, this prohibition is not necessary to protect water resources, and will not be applied. With implementation of the saturated soil restriction (see mitigation measures for soils), the water well and dam avoidance measures (see mitigation measures for range), the spring and seep avoidance prescription below, and the water crossing prohibition below, no consequential impacts to water resources are foreseen.

Mitigation: To protect artesian water flows, no source operations are allowed within 300 feet of springs or seeps. Vibroseis points may be no closer than 300 ft. Shot-holes shall be located from spring and seeps resources no closer than 300 ft, or the distance prescribed in H-3150-1 Illustration 10, p.2. (distance dependent on charge and depth), whichever is more. Shot-holes drilled into or through water-bearing zones shall be sealed with bentonite as prescribed through WOGCC regulations.

Project vehicles may not enter bodies of water (e.g, streams, reservoirs) on BLM lands. Vibe-buggies are not allowed on riparian areas.

Stream or river crossings on private or State land would be at the discretion of the landowner. The Wyoming Department of Environmental Quality (DEQ) Water Quality Division provided the following guidance for previous geophysical projects.

- a) Fording the stream is acceptable, however, vehicles and equipment should not push or pull material along the streambed below the existing water level. Frequent fording should not occur in areas where it will create extensive turbidity. If temporary crossing structures are used, they should be designed to handle possible high flows that could be anticipated during the survey period. All temporary structures must be completely removed from the stream channel at project conclusion and the area restored to a natural appearance.
- b) The operator must take care to cause only the minimum necessary disturbance. Protect streambank vegetation except where its removal is necessary for completion of the work.
- c) The operator must take care to prevent any petroleum products, chemicals, or other deleterious materials from entering the water. All equipment operated within any stream channel, pond, or wetland should be clean and free from fuel or leaks.

I. Wastes (Hazardous/Solid) (Alternative 1)

Impacts: Diesel fuel and small amounts of substances such as vehicle lubricating and hydraulic oil will be used in the field during project operations for maintenance of project vehicles. Inadvertent spillage of these could contaminate natural resources. Vehicle accidents or damage could result in fuel spills. Hazardous material containers extant in the project area, such as pipelines, could be accidentally ruptured. With implementation of the waste disposal prescription below and the safe operating distance prescription (see oil and gas mitigation measures), no adverse impact is foreseen.

Surface rehabilitation work at the closed Daniel Landfill could be adversely affected by vehicle traffic. With implementation of the dump avoidance prescription, the project should result in no interaction with solid wastes.

Project markers in the form of wooden lath, ribbon flagging, pin-flags and spray paint could contribute litter / solid waste in the project area. However, Veritas has made an operational commitment in their proposed action to remove project lath and flagging as recording operations progress, so no debris should remain behind the project as planned. No impact in this regard is foreseen.

Mitigation: The geophysical operator shall clean up all diesel, hydraulic fuel, or other spills, including contaminated soils. All spill-related material shall be hauled to a Wyoming DEQ approved disposal site. Spills resulting from ruptured pipelines or well casings shall be cleaned up as directed by DEQ and the facility owner/operator.

Activity within the (fenced off) Daniel Landfill facility in Section 23, T34N- R111W shall be limited to the pedestrian

placement of geophones.

J. Socio-economics (Alternative 1)

Impacts: Peak workforce at any one time for the M3D is expected to be approximately 60 persons and total time to complete the project is estimated at 4 1/2 months. Seismic crews would likely be headquartered in the Big Piney-Marbleton area, and transported to the job daily. Most of the workers have permanent residences elsewhere, consequently the project is not expected to place any demands on schools or other similar facilities.

Persons who own land in the M3D which is underlain by federal minerals (over which they have no control and from which they receive no royalties from any future wells which might be drilled) may be more likely to be displeased by the project. A sizeable portion of the M3D is such 'split estate' land (see Map 7).

The project would provide in excess of \$ 1.4 million directly to the local economy through private land access fees, office rental, local contract services, motels and meals for crew members, fuel, supplies, and incidental purchases.

An indirect economic benefit would be new producing gas wells in hydrocarbon-bearing strata identified through the geophysical data. The level of benefit associated with new wells would be similar to those described in the Jonah II and PAPA EIS documents. Currently approximately 89% of Sublette County's assessed property valuation is accorded to the oil and gas industry, with industrial property comprising 5%, residential property contributing 4%, agricultural land comprising 1%, and commercial and utility property each constituting less than 1% of the assessed valuation in the county (Pinedale Roundup, 9/5/02, p.6). Approval of the modified proposed action would not appreciably alter socioeconomic conditions or trends in the County.

The transitory project surface use anticipated under the modified proposed action will leave traces of the operations (i.e., tracks), but it is not foreseen that the project will degrade property values. The operator would be liable to the BLM or appropriate landowner to repair damages that adversely affect resource and/or surface value.

Mitigation: None required.

K. Air Quality (Alternative 1)

Impacts: Anticipated impact to air quality would occur from the exhaust emitted by the vibroseis buggies, a helicopter, and miscellaneous support vehicles. The maximum number of vehicles operating at a given time would be 8 buggy vibes, 1 helicopter, and 8 support vehicles. Average exhaust emission would be similar to 10 diesel powered semi-trucks and 8 gasoline powered pickups. The emission would be present during the ca. 3 month long life of proposed field recording operations. Impacts resulting from exhaust emissions are expected to be negligible.

Air quality contributions would also include fugitive dust resulting from vehicle travel on existing roads and trails, and to a much lesser extent, dust from cross-country vehicular travel. Helicopters and ATVs, rather than trucks, will be used to transport equipment off road, thus minimizing dust creation. On roads, all vehicles will adhere to posted speed limits. Overall, fugitive dust contributions are expected to be minimal and short term.

Mitigation: None required.

L. Recreation (Alternative 1)

Impacts: Physical facilities as well as the visual setting of the developed Warren Bridge Campground and semi-developed camp sites in the Upper Green River Special Recreation Management Area (UGRSRMA) could be disturbed by the M3D, and campers present during project operations could be irritated by buggy-vibe, helicopter and pedestrian traffic. No surface disturbance is permitted within one-quarter mile of recreation sites (PRA RMP ROD p. 10). With implementation of the avoidance stipulations below, however, no serious impact to campgrounds or campers is foreseen.

Fishermen and recreationists outside the campgrounds but in the UGRSRMA could be irritated by project operations including helicopter activity. No surface disturbance is permitted within the UGRSRMA (PRA RMP ROD pp. 9,10,12).

With implementation of the avoidance stipulations below, however, no serious impact to the recreation area or its users is foreseen.

The M3D project would coincide with antelope, sage grouse, deer, elk, and moose rifle hunting seasons from September 10 to October 31. Impacts to hunters would be a matter of inconvenience as they encounter geophysical activities while they are hunting. Geophysical operation activities and related noise would likely cause animals to temporarily move, which would add to the hunter inconvenience. Geophysical operations would be occurring on approximately 36 square miles of area at any given time, and most of this activity area will be limited to helicopter-assisted pedestrian geophone cable pick-up and lay-out. Considering the size of the project operations area as compared to the size of surrounding big game and sage grouse habitat and hunting area boundaries, the impact is expected to be minimal.

Rafters and boaters on the Green River and other streams could be caught by receiver cable crossings, if the cables are above the water surface or below water but above the channel bottom. Cables placed directly on the channel bottom may snag an occasional fishing lure, but would not present a safety hazard. With implementation of the cable weighting measure below, minimal impact to river recreation is foreseen.

No impacts to recreation would occur following completion of the project. Overall, impacts to recreation are considered minimal.

Mitigation: No off-road vehicle traffic is permitted on BLM lands within one-quarter mile of the Warren Bridge Campground as depicted on Map 8. Vehicle operations, including vibrating, are allowed on existing well established roads in the buffer area, but 300 ft outside the campground proper. Geophone cables may be set off-road in the area by pedestrians.

No off-road vehicle traffic is permitted within the Upper Green River Special Recreation Management Area as depicted on Map 8. Vehicle operations, including vibrating, are allowed on existing well established roads, and geophone cables may be placed off-road within the area by pedestrians.

Helicopter flights over and near the Warren Bridge Campground and Upper Green River Special Recreation Management area should be avoided as much as possible, if the facilities are occupied.

Operations within 1/4 mile of the Warren Bridge and Upper Green River campground sites may be conducted only during daylight hours.

Geophone cables placed across all navigable streams shall be sufficiently weighted to ensure that they sink to the bottom of the channel.

M. Residential Areas (Alternative 1)

Impacts: Vibroseis or shot-hole detonation source operations adjacent to homes could potentially structurally damage them, and noise associated with operations could be disruptive to residents.

State of Wyoming Oil& Gas Conservation Commission Rules and Regulations Chapter 4, Section 6.r.1 prohibits shot-hole operations within one-quarter mile of any building, unless written permission is received from the surface owner (WOGCC p. 4-23), and this rule is enforced by the State. No off-set requirements have been made by the State regarding vibroseis points.

BLM policy has established that the recommended safe distance for vibroseis operations from structures is 300 feet (BLM H-3050-1 Handbook). The BLM-recommended safe distance for shot-holes varies with the amount of charge and the depth of the drilled hole (ibid.), but for this project would likely be in the vicinity of 300 ft. However, consistent with the PRA RMP, BLM will not allow shothole or vibroseis operations on BLM land located within 1/4 mile of private residences (application of special resource mitigation guideline at PRA RMP ROD p. 60). In BLM's not granting exception to the State regulation, BLM does not impinge on the right of residence owners to grant Veritas permission to encroach closer than one-quarter mile. The location of residences relative to BLM lands has not yet been determined, but is anticipated that very few residences within the M3D lie within one-quarter mile of public surface.

Helicopter flights over and near residences and tightly confined livestock such as horses will be avoided per agreement with the respective landowner, generally by at least 500 ft, and will be in conformance with FAA regulations pertaining to residences. Veritas has made the operational commitment to conduct operations in the vicinity of residences only during daylight hours or shortly thereafter during the short-day winter period, to minimize noise / disturbance to residents. No serious impact is anticipated as a result of helicopter activity near residences.

Unanticipated project damage to existing facilities is addressed under mitigation measures for Range.

Mitigation: All source (vibroseis and shot) points shall be located a minimum of one-quarter mile from residences, unless written permission to encroach closer has been given by the resident (application of special resource mitigation guideline at PRA RMP ROD p. 60).

Note that, all residences in the project area are located on private lands. In order to operate on private lands, the geophysical operator will have to secure access permission from the respective land owner. All surface owners negotiate their own mitigation.

N. Paleontological Resources (Alternative 1)

Impacts: The proposed project is not anticipated to affect the paleontological site identified via the records search, due to its limited outcrop exposure, and vegetative cover (Frank Bain, BLM-PFO Geologist, personal communication 6/2002).

Yet-unidentified fossils of scientific interest exposed on sensitive surfaces could be destroyed or damaged by vehicle traffic. Eocene formation badlands, such as in the Red Hills area, are most likely to contain such fossils. The nature of this geophysical undertaking, modified by the implementation of the spread-out vehicle pattern (see mitigation for visual resources) and the slope restriction (see mitigation for soils), is sufficiently low-level to preclude serious impact to paleontological resources. The standard discovery stipulation would apply.

Mitigation: If vertebrate paleontological resources (fossils) are discovered on BLM land during project operations, Veritas must suspend operations which could disturb the materials, and immediately contact the BLM Pinedale Field Office Authorized Officer (AO). The AO will arrange for evaluation of the find within 5 working days and determine the need for any mitigative actions. Any mitigation would be developed in consultation with Veritas, who may be responsible for the cost of site evaluation and mitigation of project effects to the site. If the operator can avoid disturbing a discovered site, there is no need to suspend operations, however the discovery must be brought to the attention of the BLM Authorized Officer as soon as feasible.

O. Transportation Facilities/Public Safety (Alternative 1)

Impacts: Recording cables would be placed across the US and State highways and county roads. Buggy-vibes and drills would travel on and across these roads. Both of these activities would potentially interact with normal traffic on these road systems. Potential impacts include geophysical personnel being struck by traffic and collisions between slow-moving geophysical vehicles and the normal traffic. With implementation of the measures described in the proposed action, no serious impacts to transportation facilities or public safety are anticipated.

Mitigation: None needed.

P. Wild & Scenic River System (Alternative 1)

Impacts: Resource values of the potential W&SR segment identified within the M3D could be compromised, and the experience of recreationists could be diminished by project activities. With implementation of the restrictions for the Upper Green River Special Recreation Management Area (see mitigation measures for recreation), minimal effects to the Wild & Scenic river segment or its possible designation are foreseen.

Mitigation: None needed.

CUMULATIVE IMPACTS OF ALTERNATIVE 1 (PROPOSED ACTION)

Pursuant to NEPA, the BLM must consider the cumulative effects of the proposed action in conjunction with other activities. 'Cumulative impact is the impact on the environment which results from the incremental impact of the [proposed] action when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time' (40 CFR 1508.7).

Effects include : (a) Direct effects, which are caused by the action and occur at the same time and place. (b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8).

With the implementation of the mitigative measures prescribed earlier in this EA, the primary anticipated impact of the proposed action would be that of killing approximately ca.1070 ac of sagebrush via tire impacts, and driving on and damaging to some degree, but not killing, an additional ca. 592 ac of sagebrush. Together, the acres of killed and damaged/pruned brush would comprise 0.9% of the 169,555 ac project area, but would be concentrated in the sage-dominated vegetative regimes, and would comprise ca. 1.6% of the 105,120 ac sagebrush community within the project. This project effect would have ramifications primarily for visual resources, vegetation, and wildlife habitat, and so these three resources are examined in some detail here with regard to cumulative effects. No cumulative impacts to cultural, soils, livestock/grazing, water, waste, socio-economics, air quality, residential, recreation, paleontological, transportation, or wild and scenic river resources are foreseen.

Another, lesser, anticipated effect would be wildlife activity disruption, specifically conflicts with wintering/migrating big game. This aspect of the project is discussed later within the context of existing cumulative impacts to these animal herds.

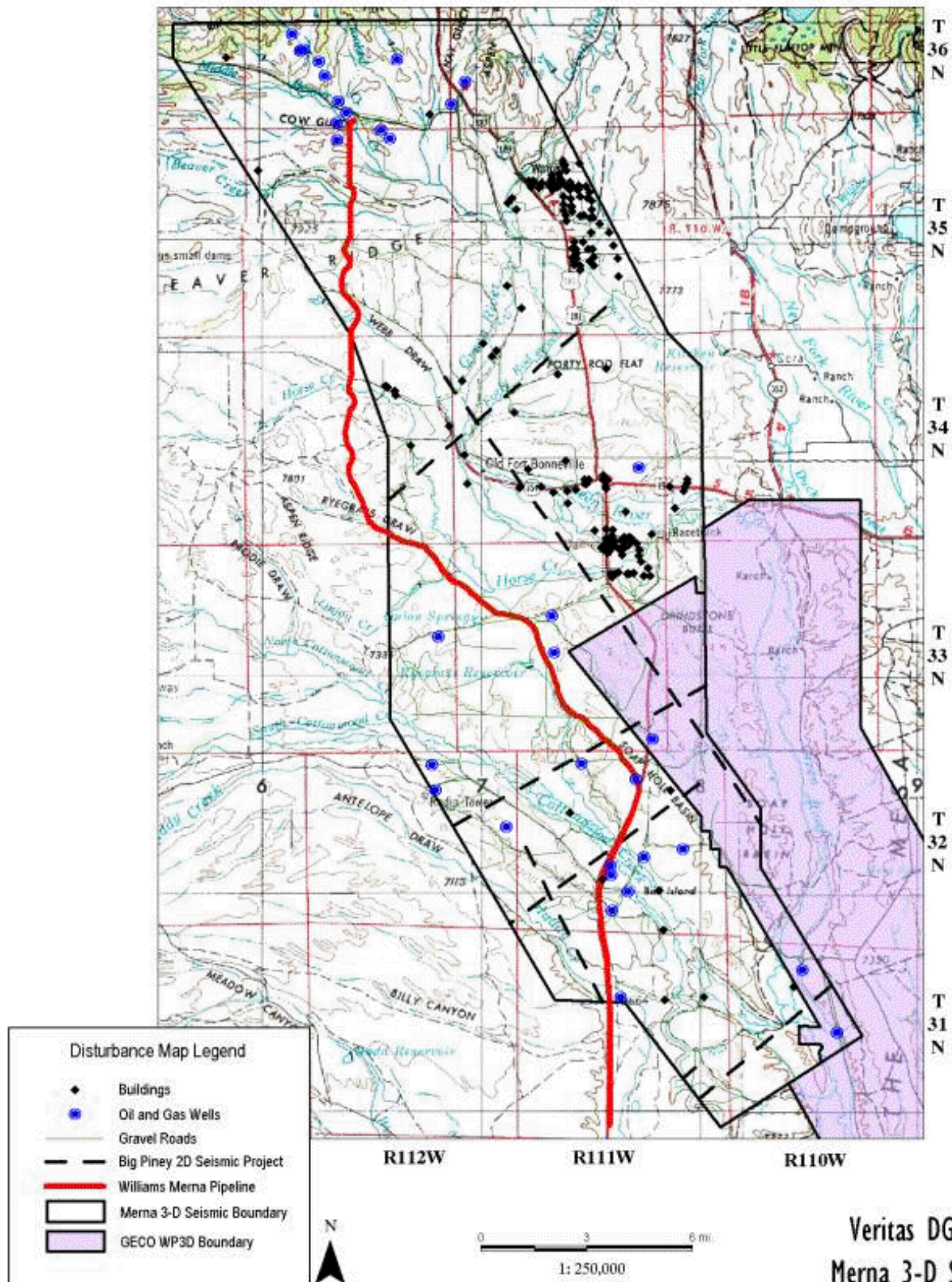
Disturbances (changes from the 'natural state') extant within the M3D may be broken into three major categories: 1) **vegetation-altering** disturbances, ranging from irrigated hayfields to re-seeded buried pipeline corridors to past seismic projects and 2) **vegetation-removing** disturbances including roads, well pads, and buildings, and 3) areas which see much **human activity**, primarily the highway corridors and concentrations of residences.

The first two of these, the existing vegetation-related impacts, are quantified in tabular form below. For simplicity's sake, all existing surface disturbance reflected in the Affected Environment (whether related to oil and gas, transportation, recreation, grazing/ranching or other activities) known for the M3D project area is aggregated. Data for the Table was derived from BLM-PFO and Sublette County GIS files. While this data is the best information readily available, undoubtedly it is not exhaustively comprehensive.

Past, existing, and currently proposed built disturbances (buildings, pipelines, wells, seismic projects) within the M3D are shown on Map 9. Existing hayfields are reflected in the vegetation section of this EA, on Map 6.

MAP 9

Recent Seismic and Other Disturbance



Estimated Existing & Proposed Surface Disturbance in Overall Project Area

Vegetation conversion /composition conversion (brush thinning) Areas

541 ac past seismic impacts:

2001 West Pinedale 3D (14,100 ac overlap into M3D x 2.9% direct impact area)

2001 Big Piney 2D (45.5 linear mi overlap x 24 ft wide swath direct impact area)

236 ac proposed Williams-Merna pipeline (ca. 26 linear mi @ 75 ft wide disturbance corridor)

52,820 ac existing irrigated hayfields

53,597 ac (31.6%) existing vegetation conversion in the 169,555 ac M3D

Vegetation removal Areas

56 ac houses or other buildings (186 structures @ 0.3 ac)

611 ac highways (42 linear miles @120 ft wide disturbance corridor)

121 ac two track roads (200 linear miles @ 5 ft wide disturbance corridor)

1,454 ac upgraded roads (400 linear miles @ 30 ft wide disturbance corridor)

122 ac (33 existing well pads @ 3.7 ac of disturbance)

56 ac (15 foreseeable well pads @ 3.7 ac of disturbance)

2,420 ac (1.4%) existing removed vegetation in the 169,555 ac M3D

** Well pads typically create 3-5 ac of surface disturbance. For consistency, and in the absence of specific information regarding the size of well pads in the project area, the well pad disturbance figure (3.7 ac) used in the PAPA DEIS (p. 2-17) is utilized here.*

In sum, 33% (56017 ac) of the overall M3D has experienced some form of surface disturbance in the past, and the proposed action would subject the project area to an additional 2.8% of surface impacts, bringing the total disturbed area to about 35.8%, or ca. 60,804 ac.

As may be expected, existing past disturbances are not evenly distributed throughout the analysis area. For example, hayfields constitute by far the largest vegetation conversion (98%), and these are concentrated along the perennial creeks and river on private lands. Excluding hayfields, less than 2% (3141 ac) of the project area has or will have experienced disturbance, according to the data presented, without the M3D. The proposed action would contribute an additional 4787 ac of vegetation conversion, bringing the total vegetative disturbance of all kinds in the project area to 4.7%, excluding hayfields.

As stated earlier, because vegetative impacts of the proposed action would most affect visual resources, general vegetation, and wildlife habitat, these resources were chosen for examination with regard to cumulative effects.

Overall, **visual resources** within the M3D have been greatly altered from their natural state by past human activity, most noticeably by hayfield cultivation and housing developments on private lands, and to a lesser degree by limited gas field development on public lands. Visible changes in the project area have not been equally distributed. The greatest changes have occurred on privately owned lands. BLM has no influence over actions on private land. Past development on BLM land has been within VRM objectives, which allow for differential impacts to visual resources. Regardless of location, the incremental visual impacts of the proposed M3D are anticipated to be very minor, where perceptible at all. BLM field inspections of past projects have repeatedly indicated that, given appropriate mitigative measures, 3D seismic projects do not leave conspicuous visual impacts. The cumulative effect of the M3D on visual resources is therefore projected to be minimal, and certainly within established VRM objectives.

As concluded earlier, project incremental effects to overall **vegetation** are considered negligible because 1) they are limited to species composition changes (not vegetation removal / dirtwork), 2) species composition changes would occur on less than 2.8% of the project area (no composition shifts are anticipated in hayfields etc.), 3) species composition shifts would involve only a proportion change among existing native plants (no introduced species), and 4) species composition changes would be short term, as new brushy plants begin to reoccupy the vehicle paths within a few years. As with visual resources, BLM field inspection of past projects has indicated that 3D seismic projects do not leave major vegetative changes in their wake. Even within the area of heaviest cumulative impact by seismic projects (the 14,100 ac overlap with the West Pinedale 3D project) direct vehicle brush thinning impacts including the proposed M3D total only 5.7%. Note that the amount / percent of sagebrush actually killed within these 'thinned' impact corridors is considerably less. Overall, native vegetation remains present in the tire paths, with only a short term species composition shift resulting. Cumulative impacts to general vegetation are therefore expected to be very minimal.

Vegetation-related cumulative impacts associated with **wildlife** resources include habitat fragmentation, qualitative changes to sage grouse habitat, and loss of big game forage within crucial winter ranges. Roads, highways, residential developments, and other existing developments have divided large areas of wildlife habitat including crucial winter range into smaller, detached "islands" of habitat. The traffic associated with these roads and developments then forces wildlife to concentrate in the smaller roadless islands to avoid or to minimize contact with humans. As regards the M3D, even though buggy-vibe operations would crush brush plants in their travel path, the proposed project would not create major breaks in the vegetative continuity, nor would it cause new roads. Consequently, it is not expected to add to the fragmentation.

Brush crushing caused by the M3D, however, will result in a systematic and relatively dispersed thinning of woody plants, mainly sagebrush, on an average of 2.8% of any brushy Section within the project area, as detailed in the vegetation impacts section of this EA. The PRA RMP ROD asserts that high priority will be given to improvement of wildlife habitat through vegetation manipulation (p.22). With regard to sage grouse, the document indicates that this species would benefit by an increase in plant diversity and in the forb component on summer range (ibid.). The ROD also provides the guideline that for sage grouse a maximum of 20 percent of sagebrush type vegetation in a 1) nesting complex, 2) winter habitat, 3) winter/year-long habitat, or 4) summer habitat area may undergo brush control treatment at one time (PRA RMP ROD p.23). (When previously treated / thinned sagebrush areas return to a sagebrush canopy cover of 25% or greater, they would be considered untreated and be added to the base acreage available for future treatment proposals <ibid.>.) (Also see wildlife and vegetation project direct impacts section of this EA).

In neither the overall M3D nor the east-central 3D double overlap area does the combined existing disturbance plus the M3D's contribution approach the 20 percent killed-brush threshold level. Within the 40 Rod Flat subdivision area, which is virtually entirely contained within a sage-grouse nesting complex, sagebrush removal is suspected to have exceeded the 20 percent threshold, via road and house building and yard / ground clearing on private land. Very little of the overlapping sage grouse nesting complex (several leks lie in the area) falls within the M3D boundary on BLM land outside the Upper Green River Special Recreation Management Area. Considering that the modified proposed action is expected to improve sage grouse habitat by increasing the forb component, no project avoidance of the BLM portion of the nesting complex is recommended. In all, it is concluded that the cumulative effects of brush thinning on sage grouse habitat in the M3D are minimal.

Brush removal can adversely affect the quantity of big game forage. As with sage grouse, big game habitat guidelines for brush control state that a maximum of 20 percent of sagebrush type vegetation may be treated at any time within 1)

winter, 2) winter/year-long, 3) or summer habitat for antelope, moose, and mule deer (PRA RMP ROD p.23). Effectively all areas of sagebrush cover within the M3D provide habitat for at least one of these species and one of these seasons, and thus is subject to this limitation. However, together, the existing sagebrush thinning and/or removal conditions within identified sagebrush habitat area plus the M3D's contribution again do not approach the 20 percent threshold level. It is therefore concluded that the cumulative effects of brush thinning on these seasonal types of big game habitats are within habitat improvement guidelines.

Within *crucial* winter ranges for antelope, mule deer, and sage grouse, habitat guidelines for brush control are more stringent, specifying 'No treatment unless beneficial to antelope, mule deer and sage grouse' (PRA RMP ROD p. 23). As noted earlier, regrowth in tire impact areas will contain a greater percentage of grass and young succulent forbs, and would fulfill generally accepted habitat improvement guidelines (see wildlife impacts section of this EA, following PRA RMP ROD and WG&FD n.d.). The near and relatively long-term effects on big game crucial winter range therefore may be beneficial, although minimal. In the immediate and very short-term, brush crushing effects are considered negligible as relates to wildlife forage and habitat, with killed brush plants remaining in situ (Scott Smith, WG&FD Pinedale Office Supervisor, personal communication 8/2002).

In sum, vegetation-related M3D disturbance, when added to existing vegetative alterations, is projected to result in minimal change, and falls well under established brush conversion thresholds reflected in the PRA RMP ROD.

Project *activity* / noise will add to existing human disruption to wintering and migrating wildlife. Existing human activity within the M3D is concentrated in the residential and commercial areas of Daniel, Daniel Junction, and Forty Road subdivision, and along Highways 191 and 189. Some of the existing developments and associated human activity in and near the M3D is located in areas conflicting with recognized big game migration. Forty Rod Flat subdivision, for example lies on a major deer migration route between the Green River Crossing and Cora Butte, with the route now skirting east of the subdivision. The Trappers Point Bottleneck just east of the M3D is a natural 1 mile wide migration corridor, now narrowed to only a half mile wide by recent housing development (Sawyer and Lindzey 2001, pp. 19-20). Existing vehicle traffic along the highways through the M3D constitutes a considerable risk to migrating game. Numerous deer and antelope are killed annually on their trek to better feed. No new subdivision zoning permits have been filed for within the M3D, and no new highways are planned. While existing areas of human activity constitute considerable impediment to migrating wildlife, approval of the modified proposed action is not expected to appreciably add to wildlife migration disruption.

No positively attributable **indirect effects** (caused by the action and later in time or farther removed in distance, but still reasonably foreseeable) are foreseen as a result of approval of the modified proposed action. Some level of oil and gas well drilling (and associated impact) in the analysis area is anticipated in the foreseeable future, but energy exploration activity is anticipated *with or without* completion of the M3D. Well drilling, if, when, and where it occurs, is the function of multiple factors, principally whether the oil and gas rights are under lease, and whether economically-producible oil and gas resources are present. As discussed earlier, oil and gas development rights in the M3D area are overwhelmingly under lease, and the existence of oil and gas wells in the area, as well as on-going drilling within the M3D attests to some level of hydrocarbon presence. While participants in the geophysical project are hopeful that data gathered via the M3D will be very positive, there is no guarantee of this. It is concluded that the modified proposed geophysical data gathering project will not in and of itself cause important direct or indirect change. Analysis of impacts related to future well drilling must be addressed when drilling plans, including at least the general number and general location of wells, are more firm. Well field development in this general vicinity (i.e. Jonah and PAPA) has been analyzed via EIS documents. Should extensive drilling be foreseen in the M3D, yet another EIS will likely be prepared.

In sum, given 1) the relatively low level and short term nature of impacts associated with vibroseis projects generally and 2) the implementation of the mitigative measures described herein, the proposed M3D, together with other federal actions and local commercial and recreational activities, is not expected to appreciably affect critical elements of the human environment. No important short or long term cumulative environmental impact is expected to result from project-related activities.

RESIDUAL IMPACTS OF ALTERNATIVE 1 (PROPOSED ACTION)

Mitigation measures developed through this EA addressing potential environmental impacts under this alternative would be included as Terms and Conditions attendant to approval of the NOI. As the mitigation measures would avoid or minimize impacts, no residual effects are foreseen.

Environmental Impacts of Alternative 2 (Winter Operations)

Under this alternative all operations associated with the Merna 3D project would be conducted during the winter when the ground is snow covered and/or frozen.

A. Animal Wildlife (Alternative 2)

Impacts: This alternative would not result in any measurable impacts to vegetation used by mule deer, antelope, sage grouse, and other species for forage and habitat (see vegetation impacts section of this EA).

Should drilling and recording operations be proposed during the sage grouse strutting, mountain plover nesting and rearing, raptor nesting and rearing, or ground-nesting bird nesting or rearing timing periods, impacts would be the same as under Alternative 1, and the same measures would be applied.

This timing-based alternative would result in conflicts with standard big game winter range restrictions. Comparison of the big game winter range map and the surface ownership maps identifies 4 main areas of BLM-controlled big game winter range: 1) a several square mile area of moose crucial winter range within the UGRSRMA-protected area, 2) ca. 10 square miles of mule deer crucial winter range just west of Cora Butte, 3) ca. 40 sq mi of mule deer crucial winter range in the Soapohole-Grindstone area south of Ryegrass Draw and Horse Creek, and 4) elk winter range, antelope crucial winter range, and mule deer crucial winter range south of the private lands flanking Cottonwood Creek.

As mentioned, the first area listed is protected by recreation-related surface restrictions. The second, Cora Butte, area would be reached by project activities approximately January 1 under this alternative; note that the Cora Butte area is a new addition to mule deer crucial winter range area. The third, south Ryegrass-Soapohole-Grindstone, area would be occupied by project activities ca. January 20 through February 15; the great majority of this area, everything west of Hwy 189, is also a new addition to mule deer crucial winter range boundaries. The fourth, Muddy Creek, area, would be scheduled for M3D operations under this alternative from ca. Feb 20 through March 15.

Review of literature indicates that in the Sublette Herd study, all mule deer captured on Cora Butte spent a portion of their winters on the Mesa (Sawyer and Lindzey 2001, p.10). The Cora Butte area, thus, serves largely as a migration route and transitional range. In average (or severe) winters very few deer remain north of Hwy 191 (Daniel). The Cora Butte area is heavily utilized by an estimated 2250 deer during the extended migration period, in November-December and from April through June (ibid. p.8). With activities in the Cora Butte area under this alternative proposed for early January, minimal impact to mule deer wintering is foreseen. No activities would be permitted in this area during the aforementioned migration / congregation periods.

The Ryegrass-Soapohole-Grindstone area serves as a transition / slow migration area for many deer heading to and from the Mesa winter range complex. In normal years it is estimated that 2750 deer migrate through the Ryegrass (ibid. p.8). For some portion of the herd, however, this is a destination wintering area (ibid. p.11). For example, heavy snows in March of 1998 pushed 5 radio-collared deer southeast out of this area onto the Mesa, but 20 of the sample deer remained near Hwy 189- Cty Rd 148 junction, or near the Grindstone Butte / Soapohole area. With activities in the Ryegrass-Soapohole-Grindstone area under this alternative proposed for Jan. 20- Feb. 15, **adverse impacts to wintering deer are likely**. The predominant impact would be animal displacement. The displacement of winter-stressed animals could result in fetal abortion by weakened females and / or the death of other weakened animals.

The Muddy Creek area includes ca. 8 square miles of elk winter range, nearly all east of the Bench Corral feedground. Potential project winter-early spring activities in this area would disrupt elk, but may not adversely affect their condition because of the supply of artificial feed available at the feedground. Should geophysical operations displace elk from the feedground, the following animal impacts could occur: malnutrition, fetal abortion/absorption, and health jeopardy. Depredation of private haystacks could occur if displaced elk move to private land. With application of the hay

provision, shothole drilling, and pedestrian shooter prescriptions below, impact to wintering elk would be reduced.

Also within the Muddy Creek portion of the M3D is ca. 4 square miles of antelope crucial winter range. Most of this piece of crucial winter range is privately owned, not within control of BLM. This fragment of crucial antelope winter range is at the eastern margin of a much larger expanse of crucial winter range. Considering the parcel size, its proximity to activity-free wintering habitat, and its marginal location as relates to crucial winter range, displacement of antelope by the project under this alternative from Feb 20-March 15 is anticipated to result in minimal effects.

And also within the Muddy Creek portion of the M3D is a ca. 12 mile long by 3/4 mile wide corridor of BLM surface south of Cottonwood Creek which is designated mule deer crucial winter range. This area represents the southern boundary of the newly-defined mule deer winter range boundary (Sawyer and Lindzey 2001 p.31). Radio-collared deer from this area followed migration patterns similar to those of the Ryegrass area, heading northward through Ryegrass, Beaver Rim and South Hoback Rim (ibid. p. 11). Deer density and distribution in the Cottonwood and Ryegrass-Grindstone-Soapstone area generally shifted in late March/early April, as the northwesterly migration began and deer from other winter complexes such as the Mesa and Ross Ridge arrived.

Under this alternative, project activities in this area from February 20 - March 15 would cause displacement, possibly initiate migration a month earlier than naturally, and possibly drive animals southward as they seek to evade activities advancing from the north. Impacts to mule deer in this area are an extension of those discussed in the Ryegrass area above.

An estimated 3500- 4000 mule deer and antelope may be expected to pass through or slightly east of the M3D area north of Daniel in November and December, most of these en route from the Green River crossing northeast of Warren Bridge to Cora Butte to Trappers Point, and on southward (Sawyer and Lindzey 2000 p. 23 and Sawyer and Lindzey 2001, p. 10, 20, 24). Big game migration activity may begin as early as late October (per WG&FD letter at Appendix C). Geophysical field operations under this alternative would be occurring at the same time in this area, roughly November 15 - December 31. As discussed under consequences of the proposed action, because nearly all M3D activities would be transitory and would occur within very small areas at one time (via small groups of pedestrians or vehicles), migrating animals would likely move around the geophysical operations and continue toward their migration destination. Impacts to migrating game would be the same as described for the Proposed Action. Of note, migration corridors have not been identified by BLM for specific seasonal restrictions, and the majority of the Warren Bridge to Trappers Point stretch is located on private lands.

Mitigation: To reduce adverse effects to wildlife, the following mitigation measures would be applied. All seasonal wildlife restrictions pertinent to the project area are listed below, even though some measures are irrelevant for the M3D project as scheduled under this alternative.

Between November 15 and April 30, moose crucial winter range willow riparian habitat areas (especially along Horse Creek) should be avoided to the extent practicable, by 1) minimizing helicopter overflights, 2) raising any overflights which are necessary to an altitude of 300 ft, and 3) hand-laying receiver lines (PRA RMP ROD pp. 10 and 58 modification/adaptation and WG&FD letter of 7/8/02).

To avoid conflict with antelope and mule deer migration routes, particularly heavily used migration corridors and identified 'bottleneck' areas, final selection of stationary project activity areas (recording truck, staging, and heli-pad areas) on non-federal land will be made by Veritas in consultation with the BLM Authorized Officer and WG&FD. (see EA map 3 and WG&FD letter of 7/8/02 in Appendix C)

To minimize impacts to wintering elk, the following measures are required.

- All source points within the elk winter closure area must be drilled prior to November 1.
- No helicopter activity and only approved land vehicle trips are permitted in or over the elk winter closure area from November 15-April 30
- Geophone cables may be dropped off along roads by trucks, utilizing the minimum possible number of trips. Geophone cable shall be laid out by pedestrians.

- Shot holes shall be detonated during daylight hours by a pedestrian shooter.
- Veritas shall provide all hay requested by G&F for use at the Bench Corral feedground this season.
- Veritas shall bear the cost of providing a temporary feeding station further from project activities, if deemed appropriate by BLM, in consultation with the WG&FD.
- Veritas shall provide an approved biologist to monitor elk in the area during any operations occurring within 1 mile of the elk closure area between November 1 - April 30. The consulting biologist will conduct monitoring as directed by the WG&F Regional Biologist, and report daily to him.
- Veritas will adjust or suspend operations as directed by the BLM, in consultation with the WG&F Regional Biologist.

If project field activities are proposed for the period between February 1 through August 15, Veritas shall provide BLM with a current active raptor nest survey of areas to be affected during this period. From February 1 through May 31 (nest selection period), geophysical operations shall not be allowed on BLM-administered lands within a 0.5 mile radius of raptor nests occupied this year or within the last 3 years, except for ferruginous hawk nests for which the seasonal buffer is 1 mile. The location of known raptor nests on BLM-administered lands which have been occupied within the last 3 years is available at the BLM Pinedale Field Office.

From June 1 through July 31 (rearing period), geophysical operations will not be permitted on BLM-lands within a 0.5 mile radius of occupied raptor nests, except ferruginous hawk nests, for which the seasonal buffer is a 1.0 mile radius. Modifications to this limitation may be applied for in writing to the BLM Pinedale Field Office. (adapted from PRA RMP ROD p. 59)

From February 15 through August 15 (rearing period), geophysical operations will not be permitted on within a 1.0 mile radius of occupied bald eagle nests (per PAPA EIS ROD p. A-19 and adaptation of T&E decision at PRA RMP ROD p.59). Bald eagle nest avoidance requirements apply to both federal and non-federal lands.

If project field activities are proposed for the period between November 15 through March 15, Veritas shall provide BLM with a bald eagle winter roosting survey of potential roost areas to be affected during this period (per PAPA EIS ROD p. A-19 and adaptation of T&E decision at PRA RMP ROD p.59). Bald eagle roost avoidance requirements apply to both federal and non-federal lands.

Veritas shall provide the BLM with a Canada Lynx Biological Assessment report for the aspen and lodgepole pine forest cover types in T36N, and receive BLM approval prior to any activity in that area. (See EA Map 6). The Assessment must be prepared by a qualified biologist, and address all potential project impacts to Canada lynx or their habitat. Based on report review, the BLM in consultation with the USFWS will determine the need for any additional measures which would be applied before approval of that project increment (adaptation of T&E decision at PRA RMP ROD p.59). This stipulation applies to both federal and non-federal lands.

Veritas shall employ a qualified biologist to aerially map, ground truth, and inventory all prairie dog colonies / burrows within 5 miles (7 km) of the project area, and to prepare and submit to BLM a report thereon (adaptation of T&E decision at PRA RMP ROD p. 59). Aerial mapping may be done via fixed-wing plane and GPS, and must be done under snow-free ground conditions. Note that this stipulation applies to both federal and non-federal lands.

Based on the prairie dog town inventory report, the BLM Authorized Officer shall determine whether any areas meet black-footed habitat criteria. Should prairie dog colonies/complexes in the project area meet ferret habitat criteria, Veritas shall use a qualified biologist to conduct a black-footed ferret search per established guidelines (USFWS 1989). Daytime/snow searches for ferret sign may be conducted from December 1 - March 31 and nocturnal ferret searches may be conducted from July 1-October 31. If a black-footed ferret or its sign is found, all action potentially affecting the colony/complex shall cease, and further action will be subject to USFWS guidance and/or restrictions (ibid.). This stipulation applies to both federal and non-federal lands.

If all project source (shot and vibe) points are re-positioned by Veritas to avoid all identified active prairie dog burrows by a minimum of 50 m, or if BLM determines that the M3D contains no ferret habitat, no ferret search will be required.

If activities are proposed to be conducted between April 10 through July 10, the geophysical operator shall provide BLM with a current mountain plover survey report covering all areas to be affected during this period (adapted from

PRA RMP ROD p.59 and USFWS 2002 mountain plover guidelines). Note that this stipulation applies to both federal and non-federal lands.

If activities are proposed to be conducted between March 1 through May 15, the geophysical operator shall provide BLM with a sage grouse lek survey report covering all BLM lands to be affected during this period (per PRA RMP ROD pp. 10, 59). Current lek / nesting survey data addressing parts of the M3D project area should be utilized as much as possible, and is available at BLM.

If activities are proposed to be conducted between April 1 through July 31, the geophysical operator shall provide BLM with a sage grouse nesting survey report covering all BLM lands to be affected during this period (per PRA RMP ROD pp. 10, 59).

Geophysical operations will not be allowed on BLM-administered lands from March 1 through July 31 within a two-mile radius of active sage grouse leks (per PRA RMP ROD pp. 10, 59 and PAPA EIS ROD p. A-19). Exception to this restriction may be applied for in writing to the BLM Pinedale Field Office.

All off-road-vehicle operations on BLM land are prohibited from April 1 to July 31, to prevent occupied nests and fledglings of ground-nesting birds, including sage grouse, from being crushed. Modifications to this limitation may be applied for in writing to the BLM Pinedale Field Office. An exception may be granted if the geophysical operator ensures that during this period all vehicles driving off road are preceded by a pedestrian 20-50 ft ahead.

To protect wildlife cover, vehicle traffic shall, where practicable, avoid stands of tall sagebrush. Stands of tall sagebrush are defined as areas in which the majority (more than 50%) of sagebrush plants are 2 ft or taller.

B. Cultural Resources (Alternative 2)

Impacts: Traffic exclusively on snow would result in no disturbance to the ground or to cultural resources in or on them. Project vehicular traffic on frozen bare ground could disturb surficial cultural resources, but this disturbance would be minimal due to the freeze-stabilized nature of the soils. An effect to cultural resources is defined as an alteration to the characteristics of an historic property qualifying it for inclusion in or eligibility for the National Register of Historic Places (43 CFR 800.16(i)). Surface artifacts on a site as a rule are not *in situ*, having been displaced vertically by past natural soil deflation and / or displaced laterally and vertically by erosion and / or re-deposition. Logic corroborated by records search indicates that sites in western Wyoming eligible for the NRHP for their information content overwhelmingly possess intact buried cultural living surfaces, and / or to a far lesser extent, artifact assemblages which are important in their own right, rather than for their locational integrity. Additional potential minor surface artifact dislodging by project vehicles would not constitute an alteration to a site's ability to yield significant information. No effect to such sites eligible for the NRHP under criterion d, regardless of their ownership, is therefore deemed likely under this alternative.

Sites eligible for the NRHP because of their direct association with important events or persons or for their construction or artistic qualities (NRHP significance criteria a-c) could suffer effects to their physical integrity or to their setting. Effects to the physical integrity of any such sites could be caused by vehicular traffic as described above. Owing to their typically intact and structural nature (e.g., historic trails and cabins), the physical integrity of such sites is more sensitive to disturbance than the (already displaced) surface manifestation of a buried archeological site. With application of the site identification and avoidance prescription below, however, no impacts to the physical integrity of sites eligible under NRHP criteria a-c is anticipated.

Effects to a site's integrity of setting, feeling and historic association would be less than under Alternative 1, due to the predominantly imperceptible 'footprint' left by operations conducted under snow and/or frozen ground conditions. No adverse effect to historic properties eligible under NRHP criteria a-c, regardless of ownership, is therefore foreseen as a result of snow and/or frozen ground vehicular operations..

Drilling shot holes through surface and buried cultural sites could cause damage and/or the loss of important cultural data. Losses could occur by physically drilling through intact cultural resources features, such as hearths or burial sites. Considering the small drill bit size (ca. 4 inches) and the planned location of drill-holes on BLM land (in alkaline-bog portions of the Soap Holes), the likelihood of drilling through an intact surface feature is evaluated as extremely

low. No effect to historic properties from drilling operations on BLM lands is foreseen.

Off-road drill buggy traffic scheduled to occur before snow and frozen ground conditions could cause damage to cultural resource sites eligible or potentially eligible for the National Register, as explicated under alternative 1, the proposed action. With the drill-route inventory prescription, no adverse effect is foreseen in this regard.

Operations near the cairns, stone circles, rock alignments or other areas of Native American Religious Concern could displace stones, adversely affecting the physical integrity of these sites, and may affect the spiritual values placed on these sites by Native Americans. With implementation of the Native American consultation and avoidance measures prescribed below, minimal impact to sites of Native American concern, regardless of their ownership, are anticipated.

Potential for unauthorized surface artifact collection by geophysical crews would be nearly eliminated under this alternative (as compared to Alternative 1, the proposed action), owing to the great reduction in pedestrian surveyors under this Alternative, and to the probable presence of obscuring snow cover during the majority of field operations. The snow cover would offer protection to all sites beneath it, regardless of ownership.

Potential adverse effects to the Green River Rendezvous National Historic Landmark (NHL) would be similar to but less than those described under Alternative 1. In consideration of the special administrative status of this property, separate consultation on project effects will be required.

Mitigation: BLM-SHPO / ACHP project-specific consultation must be complete before NOI approval, and any measures required by BLM as a result of that consultation shall be implemented as required. Inter-agency consultation may occur through the special-purpose Programmatic Agreement format referenced at H-3150-1, Illustration 9 and the Wyoming State Protocol Agreement, or via other mutually agreeable means. Note that regarding consultation with SHPO, BLM is directed to take the position that cultural resource inventories are not needed where frozen ground or snow cover conditions are sufficient to preclude rutting of soils (Manual 3150.3.1.B.4). Such conditions are requisite under the modified Alternative 2 (see mitigative measures for soils).

Veritas shall provide a Class III cultural resource inventory for all public lands where off-road vehicle travel will occur prior to snow and frozen ground conditions, including all buggy drill travel routes.. The inventory shall cover 50 feet either side of the centerline of off-road travel routes, for a total inventory coverage of 100 feet. Such inventory will not be required for areas covered by previous inventories, provided those inventories meet current standards. The cultural resource inventory will be designed to locate and prescribe avoidance routes or other mitigation for all significant or unevaluated sites, previously recorded as well as newly discovered. Standard site avoidance entails a 30 meter (100 foot) buffer zone around all eligible and unevaluated sites. Sites determined by BLM to be ineligible for nomination to the NRHP require no further action.

Off-road buggy drill traffic on BLM land shall be confined to a corridor 100 ft wide (50 ft either side of centerline) along travel routes lines which have been inventoried for cultural resources (refer to archeological inventory map), unless snow and frozen ground conditions prevail and conform to the terms of the Programmatic Agreement.

All known historic properties eligible or potentially eligible for the NRHP under criteria a-c shall be identified by Veritas' cultural resource contractor, and avoidance of these sites will be arranged by Veritas. Specifically, the location of the Opal Wagon Road shall be avoided by a distance of at least 200 ft, with no project vehicular traffic permitted on the Road itself. All standing structures shall be avoided by 300 ft or more (per H-3150-1).

The operator shall prepare a specific plan of operations regarding activity within the Green River Rendezvous National Historic Landmark (NHL), which lies on private land. After the plan has been approved by the owner(s) of the NHL, the plan shall be submitted to the BLM Authorized Officer for review, at least one week prior to field operations in that area. BLM will consult with the SHPO, NPS and ACHP as appropriate, and append special conditions of approval to this NOI as necessary to protect the National Landmark.

In order to analyze potential impacts to any sites of Native American religious concern which may be present in the M3D, BLM-Native American consultation regarding project operations is necessary. Review of SHPO site summary records and a field tour of the project would likely be in order to permit Tribal representatives to generally assess the situation. Inventory or avoidance measures may be developed by BLM as a result of this consultation. Decisions

concerning the treatment (including avoidance) of Native American religious and sacred sites would be made through the process outlined in BLM Manual H-8160-1.

C. Soils (Alternative 2)

Impacts: Activities under this alternative include the operational commitment of operating on frozen and/or snow-covered ground; it is anticipated that the great majority of project operations would occur on snow. With implementation of the off-set vehicle drive paths (see mitigation measures for visual resources), snow removal via tire friction and underlying soil compaction and erosion, as well as vegetation damage will be minimized. Consequently, compaction and soil erosion on level and gently sloping surfaces is anticipated to be negligible, and less than under alternative 1, the proposed action.

As with Alternative 1, impacts to soils could be created by operating under un-usual conditions (steep slopes, boggy ground), and the same restrictions would be applied.

Mitigation: No vehicle operations (buggy vibes, recorder trucks, pickups, ATVs) will be allowed on slopes of 25 percent or greater.

The operator shall conduct no vehicle operations during periods of or in areas of saturated ground conditions when surface rutting could occur.

On boggy alkaline soils in the Soap Holes Basin, Veritas will utilize buggy drills with flotation tires and will hand-rake the ground surface to approximate original contour and appearance within 5 days of drilling each shothole. Veritas will coordinate drilling work in the Soap Holes area with the BLM-PFO, who will conduct field monitoring of operations.

D. Livestock/Range (Alternative 2)

Impacts: Under frozen ground conditions, the potential for project vehicle damage to irrigated and sub-irrigated hayfields and pastures are expected to be considerably less than under alternative 1, the proposed action. (This point is of significance to Veritas, who concomitantly anticipates the need for fewer source point off-sets as well as a reduced risk for incurring damage / reclamation costs.) Private landowners control the irrigation facilities and hayfields, and are responsible for their own mitigation measures. The project should not result in adverse impacts to irrigation systems or hayfields under either alternative.

Project impacts as regard fences, water wells and impoundments, existing facilities and livestock forage would be similar to those under alternative 1, and the same measures would be applied.,

Mitigation: Fences and gates in the project area should be GPS-mapped prior to heavy snowfall which could cover them.

Veritas shall notify grazing lessees prior to entering upon their allotments. Addresses of affected grazing lessees will be provided by BLM.

Veritas shall make every effort to avoid disturbing or altering fences. Gates shall be used when possible. Gates must be closed immediately after passing through them. If a fence must be crossed, it shall be let down or cut (as determined by the grazing lessee or owner/operator), crossed, and immediately put back up. The wires shall be stretched to the original tension from the nearest brace or gate panel.

Vibroseis source points shall be located a minimum of 300 ft from all water wells and reservoirs. Shot-holes shall be located from these same facilities no closer than the distance prescribed in H-3150-1 Illustration 10, p.2. (distance dependent on charge and depth).

Any facilities damaged, destroyed or removed in connection with this geophysical exploration operation shall be immediately restored to original condition or replaced with a similar facility.

E. Visual Resources (VRM) (Alternative 2)

Impacts: In-line off-road vehicle traffic could cause long linear obtrusions. To minimize visual impacts, to reduce soil compaction, to reduce the degree of vegetation loss, and to minimize snow removal caused by repeated tire friction, an off-set vehicle pattern will be required. With implementation of the vehicle off-setting system prescribed below, visual impacts are anticipated to be extremely low level and short term.

It has been observed on projects conducted under winter conditions in the Rock Springs Field Office area that sagebrush kill and the associated visual 'footprint' of the project is greatly reduced, as compared to summer and fall operations. Recent winter vibroseis operations in Wyoming conducted on snow have been found to leave very little trace, with nearly entire projects becoming imperceptible after snowmelt (7/30/02 presentation by Russell Tanner, BLM-RSFO).

Mitigation: The geophysical operator shall off-set side-by-side all off-road vehicle traffic, so that one vehicle does NOT drive the same path as another vehicle. If snow plowing is needed, the plow blade must be kept a minimum of 12" above the ground to prevent vegetation removal.

F. Vegetation (Alternative 2)

Impacts: The location and size of the project direct impact area (ca. 4787 acres of land, or 2.8% of the project area) would remain approximately the same as alternative 1. However, impacts to vegetation are anticipated to be greatly reduced under winter operations. Brush kill is expected to be substantially less than estimates for alternative 1, but there have not been enough winter geophysical operations in the southwestern Wyoming region to reasonably predict a brush loss percentage. Recent winter vibroseis operations in Wyoming conducted on snow have been found to leave very little trace, with nearly entire projects becoming imperceptible after snowmelt (7/30/02 presentation by Russell Tanner, BLM-RSFO).

Sagebrush thinning, and the resulting mixed-age of brush stands / wildlife habitat improvement, would not occur under this alternative.

Standard protective measures for vegetation would be applied.

Mitigation: No trees may be cut or broken. Vehicles may not drive on willows.

The geophysical operator shall reclaim and reseed any areas where their operations have caused unplanned surface rutting or have otherwise removed all of the surface vegetation, as directed by the Authorized Officer.

To prevent the introduction of new weeds, the geophysical operator shall thoroughly power-wash all field vehicles (buggy vibes, pick-ups, ATVs, etc), particularly their undercarriages, before transporting them to the project area.

To quarantine an area of the Soapholes with weed problems, any vehicle associated with the project and working between Hwy 189 and the Green River north of Cottonwood Creek and south of Grindstone Butte shall be thoroughly washed before entering and before leaving this area. Approved exit points from the described area are located at the intersection of Hwy. 189 and Sublette County Road 146 and the intersection of Hwy 189 and Sublette County Road 147. Equipment washing shall occur at or near these approved exit points. This stipulation applies to all vehicles driving off-road within this area.

G. Oil and Gas /Minerals (Alternative 2)

Impacts: Project impacts regarding oil and gas / mineral resources would be similar to those under alternative 1, the proposed action, and the same conditions of approval would be applied.,

Mitigation: Vibroseis source points shall be located a minimum of 300 ft from all oil and gas wells, highways, and other existing rights-of-way including roads, pipelines, powerlines and buried cables, unless written permission to encroach closer has been given by the owner/operator. Shot-holes shall be located from these same facilities no

closer than the distance prescribed in H-3150–1 Illustration 10, p.2. (distance dependent on charge and depth).

H. Watershed and Water Resources (Alternative 2)

Impacts: Project impacts regarding water resources would be similar to those under alternative 1, the proposed action, and the same conditions of approval would be applied.,

Mitigation: Vibration points BLM-administered lands will not be allowed within 300 feet of surface water, flowing streams, springs, or riparian areas, except at existing crossings. Shot-holes shall be located from these same water resources no closer than the distance prescribed in H-3150–1 Illustration 10, p.2. (distance dependent on charge and depth).

Stream or river crossings on private or State land would be at the discretion of the landowner. The Wyoming Department of Environmental Quality (DEQ) Water Quality Division provided the following guidance for previous geophysical projects.

- a) Fording the stream is acceptable, however, vehicles and equipment should not push or pull material along the streambed below the existing water level. Frequent fording should not occur in areas where it will create extensive turbidity. If temporary crossing structures are used, they should be designed to handle possible high flows that could be anticipated during the survey period. All temporary structures must be completely removed from the stream channel at project conclusion and the area restored to a natural appearance.
- b) The operator must take care to cause only the minimum necessary disturbance. Protect streambank vegetation except where its removal is necessary for completion of the work.
- c) The operator must take care to prevent any petroleum products, chemicals, or other deleterious materials from entering the water. All equipment operated within any stream channel, pond, or wetland should be clean and free from fuel or leaks.

I. Wastes (Hazardous/Solid) (Alternative 2)

Impacts: Project impacts regarding wastes would be similar to those under alternative 1, the proposed action, and the same conditions of approval would be applied.,

Mitigation: The geophysical operator shall clean up all diesel, hydraulic fuel, or other spills, including contaminated soils. All spill-related material shall be hauled to a Wyoming DEQ approved disposal site. Spills resulting from ruptured pipelines or well casings shall be cleaned up as directed by DEQ and the facility owner/operator.

Activity within the (fenced off) Daniel Landfill facility in Section 23, T34N- R111W shall be limited to the pedestrian placement of geophones.

J. Socio-economics (Alternative 2)

Impacts: Under the winter operations alternative, the M3D project would bring in an estimated \$950,000 in direct economic benefit to the Big Piney/Pinedale area through private land access fees, office space rental, motels and meals for crew members, fuel, supplies, and other incidental purchases. Indirect economic benefits from subsequent drilling and producing new oil or gas wells in hydrocarbon pools located by the seismograph data would be the same as under Alternative 1. The level of benefit associated with new wells would be similar to those described in the Jonah II EIS.

Economic savings as compared to alternative 1, the proposed action, would total approximately \$325,000. Savings would be gained via the elimination of costs associated with surveying the source points and costs associated with archeological inventories. The opportunity for wintertime work would be beneficial for Veritas and its crew employees,

many of whom would otherwise be laid off.

Project impacts are regards energy development and real estate values would be similar to those under alternative 1.

Mitigation: None necessary.

K. Air Quality (Alternative 2)

Impacts: Fugitive dust would not be created under winter conditions. Otherwise, project impacts to air quality would be similar to those described under alternative 1, the proposed action.

Mitigation: None required.

L. Recreation (Alternative 2)

Impacts: Project impacts would similar to, but somewhat less than, those under alternative 1, as project winter operations would not coincide with most recreationists, who utilize the area primarily in summer and fall. Similar conditions of approval would be applied.

Mitigation: No off-road vehicle traffic is permitted on BLM lands within one-quarter mile of the Warren Bridge Campground as depicted on Map 8. Vehicle operations, including vibrating, are allowed on existing well established roads in the buffer area, but 300 ft outside the campground proper. Geophone cables may be set off-road in the area by pedestrians.

No off-road vehicle traffic is permitted within the Upper Green River Special Recreation Management Area as depicted on Map 8. Vehicle operations, including vibrating, are allowed on existing well established roads, and geophone cables may be placed off-road within the area by pedestrians.

Helicopter flights over and near the Warren Bridge Campground and Upper Green River Special Recreation Management area should be avoided as much as possible, if the facilities are occupied.

Operations within 1/4 mile of the Warren Bridge and Upper Green River campground sites may be conducted only during daylight hours, if the facilities are occupied.

Geophone cables placed across all navigable streams shall be sufficiently weighted to ensure that they sink to the bottom of the channel. Frozen streams are not navigable.

M. Residential Areas (Alternative 2)

Impacts: Project impacts to residential areas would similar to, but less than, those under alternative 1, as substantially fewer residences would be occupied and project noise would be somewhat muffled by snow presence.

Mitigation: None needed. Note that the geophysical operator will have to secure access permission from each land owner within the project area. All property owners negotiate their own mitigation.

N. Paleontological Resources (Alternative 2)

Impacts: Snow and frozen ground conditions would serve to protect the ground surface, so no effects to paleontological resources are anticipated.

Mitigation: None required

O. Transportation Facilities/Public Safety (Alternative 2)

Impacts: Project impacts would be similar to those of alternative 1, the proposed action.

Mitigation: None needed.

P. Wild & Scenic River System (Alternative 2)

Impacts: With application of the avoidance measure for the (see mitigation measures for recreation), no effects to the Wild & Scenic river segment or its possible designation are foreseen.

Mitigation: None needed.

CUMULATIVE IMPACTS OF ALTERNATIVE 2 (WINTER OPERATIONS)

As stated above, with the implementation of mitigative measures prescribed for operations under this alternative, anticipated impacts to cultural resources (considering sites on both federal and non-federal land), soils, visual resources, vegetation, recreation, and paleontological sites would be **similar to but less than** those described under alternative 1. Impacts to livestock/range, oil & gas/minerals, watershed, wastes, socio-economics, air quality, residential areas, transportation/public safety, and Wild and Scenic River systems would be **essentially the same** as those described for alternative 1. Please refer to the cumulative impact discussion for alternative 1 for an assessment of cumulative impacts regarding these resources. This winter operations alternative, however, would result in greater potential impacts to wildlife in the form of noise and human activity-related disturbance to wintering mule deer, particularly in the winter range area south of Horse Creek. On a somewhat broader scale, slowly migrating and wintering deer typically inhabiting this area would potentially be displaced to undetermined areas, increasing competition for winter browse there. Winter operations in crucial mule deer and antelope winter range areas under this alternative would be additive to existing disturbances, such as traffic on highways and County roads and the constant human activity in private subdivisions. Winter operations could exacerbate the effects of winter stress associated with cold temperatures and snow-covered forage. There could result in increased winter stress-related impacts to wintering mule deer and antelope, such as fetal absorption/abortion and mortality.

RESIDUAL IMPACTS OF ALTERNATIVE 2 (WINTER OPERATIONS)

Due to the transitory nature of project operations and their relatively brief presence of geophysical operations in big game winter ranges, minimal to no measurable residual impacts are foreseen.

Environmental Impacts of Alternative 3 (No Winter Operations)

Under this alternative, all operations and anticipated project impacts would be similar to those described for Alternative 1, the proposed action, except that no field operations would occur between November 15, 2002 and approximately August 2003, assuming that the overall project would adhere to the outlined project schedule. In contrast to alternative 1, the proposed action, the outlined scheduling scenario has different ramifications for wintering wildlife and recreation, discussed below. All environmental consequences, and all mitigative measures appended to alternative 1, would also apply to this alternative, except as specified below.

It should be noted that it is still possible for geophysical operations to occur on private and state lands, where BLM authorization is not required (also see alternative description and impacts discussion for the No Action alternative). Should the project operations go forward on non-federal lands, anticipated impacts would be similar to those described under the No Action alternative.

A. Wildlife (Alternative 3)

Impacts: In contrast to alternative 1, project activities under the no-winter-operations alternative would not take place concurrently with most deer and antelope migration activity north of Daniel. As stated earlier, an estimated 3500- 4000 mule deer and antelope may be expected to pass through or slightly east of the M3D area north of Daniel in November and December, generally en route from the Green River crossing northeast of Warren Bridge via Cora Butte to Trappers Point and on southward (Sawyer and Lindzey 2000 p. 23 and Sawyer and Lindzey 2001, p. 10, 20, 24). Some migration activity, however, could begin as early as late October (per WG&FD letter at Appendix C). It is anticipated that minimal geophysical-migrating big game interaction would take place under this alternative, assuming

that the project operations would not go forward on non-federal lands.

In contrast to alternative 1, project activities would not occur in or near crucial moose winter range after November 15. Specifically, no interaction would take place between geophysical operations and moose wintering in these designated ranges along the Green River, North Beaver Creek and South Beaver Creek, north of Daniel. As stated earlier, north of Daniel, moose densities in the M3D are known to be generally low (Doug McWhirter, Pinedale WG&FD biologist, personal communication), but specific figures are not available. No potential impacts to wintering moose by the project under this alternative are foreseen, assuming that the project operations would not go forward on non-federal lands.

Mitigation: All mitigative measures appended to alternative 1, the proposed action would apply, except:

The measure prohibiting operations November 15-April 30 on big game crucial winter range and elk feedgrounds would be dropped.

The mitigative measures for moose crucial winter range November 15-April 30 would be dropped.

The following measure would be added:

No geophysical operations are permitted Nov. 15 - Apr 30, to protect migrating and wintering big game.

L. Recreation (Alternative 3)

Impacts: Project impacts would be similar to those described under alternative 1, except that overlap with hunting activities would occur in two Fall hunting seasons (both 2002 and 2003).

Mitigation: No additional mitigation needed. Same as alternative 1.

CUMULATIVE IMPACTS OF ALTERNATIVE 3 (NO WINTER OPERATIONS): Assuming that the project operations would not go forward on non-federal lands, cumulative impacts under this alternative would be similar to those described for the proposed action, except that the potential disruption to migrating big game (who currently encounter migration barriers including recent subdivision development and dangerous highway traffic) would be substantially reduced due to the project's curtailed fall/winter schedule under this alternative. Should operations be conducted on state and private lands, the cumulative impacts would be similar to those described for the proposed action with the public lands discounted.

RESIDUAL IMPACTS OF ALTERNATIVE 3 (NO WINTER OPERATIONS): None anticipated.

Environmental Impacts of Alternative 4

(No Action)

Alternative 4 Discussion for All Lands: Under this alternative, the proposed geophysical project would not be authorized on BLM-administered surface. Operations could still occur on state and private lands. BLM land comprises about 40% of the project area, concentrated in the south half of the M3D boundary. Considering that private and State lands comprise the remaining 60% of the M3D area, and that the overwhelming majority of the minerals under these private and state lands are leased for oil and gas, adoption of the No Action alternative could very likely result in the completion of the northern roughly half of the project without including public land tracts in that area. Such a project could be carried out entirely without federal (BLM, FWS, ACHP) oversight.

Adoption of this alternative would not mean that oil and gas development (well drilling) would not occur. Over 90% of private, state and federal minerals in the project area have been leased, with mineral lessees granted the right to produce oil and gas reserves contained within those leases. Therefore, with or without the geophysical data, well drilling is anticipated in the M3D.

Ideally, when subsurface data is correlated with known environmental surface concerns, wells can be planned where maximum resource extraction can be achieved with minimal environmental degradation. With knowledge of subsurface structure, oil companies may be more willing to do directional drilling from outside sensitive environmental areas to high potential reserves underlying those sensitive areas. Without the geophysical data, these opportunities would, in all likelihood, be lost.

The adoption of this alternative, assuming the entire project would be canceled, would mean that the impacts quantified in the analysis of the proposed action would not take place (i.e., 4787 ac of surface would not be subjected to tire impacts, buggy-vibes; ATVs, pedestrians and the helicopter would not be present in the project area, and project-driven archeological and biological inventories would not be conducted).

While adoption of this alternative, assuming the entire project would be canceled, would cause no direct environmental impacts, it would result in the following indirect environmental impacts and direct socio-economic impacts:

Impacts for All Lands: Without the 3D data, lessees are more likely to drill 'dry holes', resulting in greater environmental impact than if they had the 3D data. Well pad and access road construction (for dry holes or otherwise) involves complete removal of vegetation cover and contribute to landscape / habitat fragmentation. Seismic exploration is one of the less surface disturbing means available to a lease holder for exploration.

To fully develop the field / extract all economically producible hydrocarbons, more producing wells may be needed than would be required with efficient well placement based on 3D geologic subsurface information. Additional (inefficiently placed) producing wells will also result in greater environmental impacts.

With knowledge of the subsurface strata/structure, the lease holder/operator would have more flexibility to move proposed well locations away from sensitive areas, and still direct the drilling to hit spots most likely to contain producible hydrocarbons. This should result in an indirect benefit to sensitive environmental settings within the M3D. Without 3D data, lessee willingness to directional drill in order to preserve sensitive areas will likely be less.

Project-driven (and financed) archeological and biological inventories in the M3D would not take place under this alternative. The lack of studies would not adversely affect these resources, but also would not contribute to the existing database concerning resources in the area.

The proposed action would generate an estimated \$1.4 million for the local economy through access fees, as well as, food, fuel, and incidental purchases for the seismic crews. Under the No Action alternative this economic opportunity would be lost. Also, the proposed action increases the probability of pinpointing subsurface hydrocarbon pockets where successful wells could be drilled. Each new producing well would have the positive economic benefits discussed in the Jonah II and PAPA EIS documents. Without the 3D information those hydrocarbon pockets may go untapped and the associated economic benefits would potentially be lost. It is not possible to accurately project the relative indirect socio-economic benefits/impacts between the proposed action and the no-action alternatives, because the future actions resulting from both alternatives are unknown. In both cases, some level of economic benefit to the local community, the lessee, and the public are anticipated.

Mitigation for All Lands: None needed.

Alternative 4 Discussion for Private and State Lands: As discussed above, selection of the No Action alternative could still result in the completion of project operations in roughly the northern half (approximately 50%) of the project without including public land tracts in that area. Were this to occur it would not require BLM approval nor would it be subject to Federal (BLM, FWS, ACHP) oversight.

Impacts for Private and State Lands: Anticipated impacts would be essentially the same that would occur on the private and state lands through the proposed action. The primary difference would be that approximately 2400 acres of vegetation and soils could be affected from vehicle operations occurring on private and state lands in the northern portion of the project area.

Without federal oversight there would be a potential for affects to T and E Species or habitat that may occur on the private or state lands. As an example, Canada lynx habitat could be affected if operations on the private or state lands resulted in removal of trees. Likewise, previously recorded privately owned cultural resource sites eligible for the National Register could be adversely affected.

Mitigation for Private and State Lands: As required by landowner (private or the State of Wyoming).

CUMULATIVE IMPACTS OF ALTERNATIVE 4 (NO ACTION): If no recording operations occur on the M3D, no cumulative impacts would occur. Should operations be conducted on state and private lands, the cumulative impacts would be similar to those described for the proposed action with the public lands discounted.

RESIDUAL IMPACTS OF ALTERNATIVE 4 (NO ACTION): None anticipated.

SHORT-TERM COMMITMENT OF RESOURCES VS. LONG- TERM PRODUCTIVITY:

A. Alternative 1 (The Proposed Action): The proposed action would result in the short term use of approximately 4787 acres of land surface (1915 acres of BLM, 2633 acres of private, and 239 acres of state) to collect subsurface data on 169,555 acres. In brushy vegetative regimes, the project would cause a short-term reduction in the amount of brush, primarily sagebrush, available for wildlife forage and habitat, totaling an estimated 1070 acres of killed sagebrush and another 582 acres of damaged sagebrush. However in the long-term, the project should increase the long-term brush and big game forage productivity by replacing older sagebrush plants with younger, more succulent plants. It could increase the long-term fluid mineral extraction productivity from the subsurface by locating unknown strata that potentially contain hydrocarbon reserves. It may also help maintain the current productivity level of the surface acres by pinpointing subsurface areas where well drilling and the associated surface disturbance would not be justified.

B. Alternative 2 (Winter Operations): This alternative would collect geophysical data with lesser disturbance to surface (vegetation, soil, cultural, visual etc.) resources, but adverse impacts to wintering big game are possible; the short- and medium- term commitment of resources would be greater than under alternative 1, and could be significant. Long-term productivity in terms of vegetation for wildlife habitat and forage, and of oil and gas mineral development would be roughly equal to those under alternative 1.

C. Alternative 3 (No Winter Operations): Commitment of resources and anticipated productivity under this alternative would be similar to those for alternative 1, except that potential for disruption to migrating big game would be reduced, while acquisition of geophysical data for half the project would be delayed approximately 10 months.

D. Alternative 4 (No Action): Under this alternative, oil companies would continue to drill wells without benefit of the subsurface data that the geophysical project would provide. Without the data, they are more likely to drill into strata without hydrocarbon bearing potential. The drilling of such 'dry holes' would result in a short-term commitment of vegetative resources at the well-pad and access road sites, with no long-term productivity or benefit. The alternative would involve no commitment of surface resources, but also would not result in a long-term rejuvenation of sagebrush along the vibe-buggy drive paths.

MONITORING:

The BLM-Pinedale Field Office will conduct regular compliance inspections to monitor environmental concerns and adherence to mitigation.

PERSONS/AGENCIES CONSULTED:

Bill Lanning, Keith Andrews, Dave Vlcek, Steve Laster, Doug Powell, Bill Wadsworth and Martin Hudson of BLM-PFO,

Doug McWhirter and Scott Smith of the WG&FD Pinedale Regional Office, Barbara Franklin of the BTNF-Big Piney Ranger Station, Audrey Taylor and Terence Root of the USFWS, and Mike Dighans of Veritas have reviewed and/or provided input to this document. Scoping notices for the original project were placed in the Casper Star-Tribune, the Pinedale Roundup, and the Sublette County Journal. A copy of the scoping notice and the resulting comments received is included at Appendix C of this EA. Responses to the comments are included at Appendix 1 of the Decision Record.

Although not specific to this project, geophysical data collection has been a topic of discussion at public meetings for the Pinedale Anticline Oil and Gas Exploration and Development Project EIS. In general, people attending those meetings feel that geophysical data should be collected for the Anticline area to help determine where wells should be drilled, and more importantly where the subsurface stratum does not justify drilling. (Note: This sentiment was less apparent at the August 3, 1999, BLM Openhouse/Workshop. People are more opposed to geophysical activity if it would potentially occur on their private property).

Preparer(s): _____

Carmel Kail, Kail Consulting

under the direction of

Bill Lanning, BLM-PFO

Date: _____